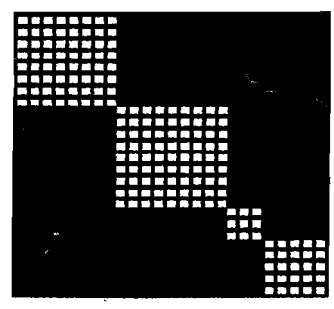


**COLLOQUE INTERNATIONAL**

**sur**

**les méthodes de blocs  
sériation et applications**



---

**Recueil des conférences**

---

**STRASBOURG**

**3 – 4 – 5 avril 1990**

**Ecole Nationale Supérieure des Arts et Industries de Strasbourg**

***Patronage***

**AFCET**

**Association Française pour la Cybernétique Economique et Technique**

**IBM France**

**Centre Scientifique de Paris**

**INRIA**

**Institut National de Recherche en Informatique et Automatique**

**CUS**

**Communauté Urbaine de Strasbourg**

***Comité de programme***

J.P Descles

G.Govaert

I.C Lerman

**F. Marcotorchino**

B. Mutel

J.M Proth

B. Turner

Les Méthodes d'Analyse des Données face à l'Information  
Stratégique et l'Innovation

QUONIAM L., DOU H., HUOT C.

Centre de Recherche Rétrospective de Marseille  
Faculté des Sciences de St Jérôme  
13397 Marseille CEDEX 13 .

L'analyse des Bases de données disponibles en ligne de façon automatique a été rapportée depuis longtemps.

Ces analyses sont envisageables sous plusieurs angles:

1) Les analyses des distributions de fréquences, de quelque paramètre que ce soit, ont déjà été étudiées à des fins modélisatrices:

a-Le modèle de ZIPF (1) sur les distributions de fréquences de mots

b-Le modèle de LOTKA (2) pour la modélisation de la production scientifique

c-Le modèle de BRADFORD (3) pour gérer les fonds documentaires

d-Plus récemment les travaux de BROOKES (4) qui reprennent les modèles précédents et les travaux de LAFOUGES (5) sur la modélisation de la circulation des ouvrages d'un fonds documentaire

2) Les analyses de contenus avec deux approches différentes:

a-L'approche linguistique par des analyses syntaxiques, morphologiques ou morpho-syntaxiques (6).

b-L'approche mathématique avec les méthodes d'analyse des données. C'est ce dernier aspect qui retiendra toute notre attention.

Ces méthodes sont nombreuses et leurs applications pour l'analyse de contenus de bases téléchargées ou non ont déjà été traitées en détail (7)(8)

Ces méthodes sont applicables dans le cas d'analyses situationnistes, c'est à dire quand les tendances principales sont à mettre en évidence. Leur application quant à la recherche d'innovations ou d'informations stratégiques est à notre avis plus délicate.

Avant de développer ce dernier point, il nous faut expliciter la notion d'information stratégique et d'innovation.

-Innovation

Dans le reste de notre exposé la nécessité absolue d'innover de ne pas se contenter de produire et de vivre sur ses acquis sera considérée comme postulat de base.

- Information Stratégique:

L'information stratégique est définie par JAKOBIAK (9) comme celle qui permet de répondre aux Facteurs Critiques de Succès (FCS). Ceux-ci correspondent aux quelques domaines pour lesquels il est vital d'être en permanence bien informé (10). Ces notions sont applicables tant au niveau industriel qu'au niveau académique et permettront d'avoir une politique dynamique dans l'unité considérée, en confortant les degrés de liberté de l'entreprise .

La nécessité de trouver dans les bases téléchargées les phénomènes porteurs d'innovation sont donc, pour ces concepts, devenus une priorité absolue. Nous ne développerons pas ici le choix de la base de données qui doit être judicieux en fonction du niveau de perception (Bases brevets pour des innovations technologiques, etc...) ou de la matière (Bases spécifiques à la chimie ou...). On tiendra comme acquis que l'interrogation est pertinente.

Intéressons-nous donc aux méthodes de recherche de processus innovants dans les téléchargements:

- Utilisation des commandes à caractères statistiques disponibles en ligne

Les serveurs ont mis à la disposition des utilisateurs des commandes (par exemple GET sur le serveur ORBIT) permettant d'obtenir des comptages de certains termes (mots clé, Registry numbers, codes...). L'utilisation de ces commandes à différents intervalles de temps (T, T+1...) permet de voir les apparitions d'apax en fonction du temps ou l'augmentation des fréquences d'utilisation de certaines dénominations (Fig. 1 à 4). Elle permet également les mêmes recherches concernant des lieux différents (Fig. 5 à 9) (11). Elles permettent enfin de traiter les recherches documentaires particulières où les opérateurs booléens sont inefficaces (Fig. 10 à 14).

Si ces commandes sont très puissantes, leur utilisation reste fastidieuse car la comparaison de 2 ou X listes de 3000 termes n'est pas aisée, mais surtout est impossible en ligne. D'où les travaux de notre laboratoire pour créer un logiciel de retraitement, hors temps serveur, des résultats de ces commandes (12).

-La détermination de fronts de recherche par les citations de brevets:

On peut admettre que les citations de brevets sont plus objectives que les citations dans les domaines académiques dans la mesure où elles ne sont pas générées par les auteurs. Elles constituent donc une source de recherche de processus innovants. Les brevets cités sont-ils très récents? Ou, au contraire, la technologie sur laquelle s'appuie les brevets étudiés est ancienne et il s'agit donc d'amélioration et non d'innovation.

Là encore, nous avons **développé** des outils (non **publiés**) permettant d'extraire directement les dates des brevets cités afin d'en obtenir un profil d'âge (**Fig. 15 à 21**).

Notre propos **n'étant** pas de **développer** ici la liste exhaustive des méthodes de recherche d'innovation, nous nous **arrêterons là** pour essayer de dégager maintenant notre **problématique** vis à vis de l'analyse des données.

Nous avons vu qu'une partie de nos **études** repose sur des comparaisons à différents temps. Or, à notre connaissance, **il** n'existe pas de **méthodes** reposant sur des comparaison directe ou soustraction de deux matrices obtenues a des temps T, T+1..., excepté, peut-être l'analyse **procustéenne** (13), dont l'utilisation et l'interprétation ne sont d'ailleurs pas aisées. De toute façon le deuxième problème posé par ce type d'analyse est plus crucial: les faibles **fréquences**. En effet, les processus innovants sont toujours, par **définition**, encore peu **développés** et les matrices construites autour de ces thèmes, qu'elles soient d'occurrences ou de cooccurrences sont clairsemées et les **méthodes** d'analyse classique restent inopérantes:

-Nous obtenons des Analyses Factorielles avec presque autant d'axes significatifs que de variables

-Les **méthodes** de classification automatiques ne sont pas plus efficaces, surtout s'il s'agit de méthodes **hiérarchiques** (les plus répandues) car on peut se poser la question de la signification de l'optimisation des routes hiérarchiques entre groupes. Dans tous les cas, **il** nous est impossible de déterminer a priori le nombre de groupes **présents** (**Fig. 22 et 23**).

Nous avons déjà testé et montré le grand intérêt des analyses de **données** à but situationniste (14). Des modèles ont **déjà été** validés (**Fig. 24 à 27**).

Nous avons longuement testé les méthodes d'analyses **multivariées** (AFCM, ACP, Classifications automatiques) et leurs outils existants (CLUSTAN, STATITCF, STAT-GRAPHICS, PCSM, RATS...), nous n'avons pas trouvé satisfaction à l'intérieur de ceux-ci pour l'analyse de processus porteurs d'innovation.

Notre **spécialité** étant l'analyse de l'information dans son ensemble depuis la recherche des facteurs critiques de succès jusqu'à la création d'informations élaborées, nous entreprenons une collaboration effective dans la recherche mathématique en analyse de **données**, celle-ci devant prendre en compte les besoins spécifiques à la détection de l'innovation dans des corpus documentaires issus de bases de données.

## **BIBLIOGRAPHIE**

- 1 ZIPF G.K.  
The psycho-biology of language; an introduction to dynamic philology.  
Cambridge, Mass., M.I.T. Press, 1965
- 2 BRADFORD S.C.  
Sources of information on specific subjects.  
Engineering V. 137, N. 3550, 26 jan.1934, p. 85-6
- 3 LOTKA A.J.  
The frequency distribution of scientific productivity.  
Journal of the Whashington Academy of Science  
V. 16, 1962, p 317-23
- 4 BROOKES B.C.  
The **derivation** and application of the Bradford-Zipf distribution.  
journal of documentation, V. 24, N. 4, Dec.1968, p. 247-65
- 5 LAFOURGE T.  
Transformation bibliométrique.  
revue française de bibliométrie, N. 6, Fev 1990, p. 331-45
- 6 ROLLAND C.; PROIX C.  
Une approche linguistique pour la conception de systèmes d'information  
revue française de bibliométrie, N. 6, Fev 1990, p. 17-40
- 7 DUTHEUIL C.  
Du corpus documentaire à l'interprétation des résultats de l'analyse de données.  
revue française de bibliométrie, N. 6, Fev 1990, p. 90-104
- 8 DORE J.C.; GILBERT J.; MIQUEL J.F.; DEROLEDE A.; DUTHEUIL C  
Banques de données et analyses multivariables  
**congrès CNIC 1986**
- 9 JAKOBIAK F.  
Maitrisser l'information stratégique et critique  
éditions d'organisation, 1988
- 10 ROCKART J. F.  
Chief executives **define** their own data needs  
Harvard Business Review, March-April, p. 81-93, 1979
- 11 QUONIAM L., DOU H., HASSANALY P.  
La Bibliométrie pour construire une Coopération efficace  
Colloque de l'Association Francophone d'Amitié et de Liaison  
UNESCO - 7 et 8 Déc. 1988 - Paris
- 12 DOU H.; HASSANALY P.; QUONIAM L.  
Easy mapping classification of patent references with microcomputers  
The Montreux 1989, International Chemical information Conference, p 283-310.

13 FICHET B.; ROUX M.

Analyse procusteenne pour la comparaison de schémas  
factoriels.

Congrès S.F.B.A., Les systèmes d'informations Blaborées  
Sep 1987, p 87-91

14 QUONIAM L.; DOU H.; HASSANALY P.; GILBERT M.

Analyses des données et traitement automatique de  
l'information

soumis a ANALUSIS

PROG :

THERE ARE 576 UNIQUE VALUES.  
OCCURRENCES TERM

20	PETROLEUM REFINING
12	PETROLEUM RECOVERY
11	FUELS
11	PETROLEUM
10	ASPHALTENES
9	<b>GASOLINE</b>
9	<b>67-56-1</b>
8	CATALYSTS AND CATALYSIS
8	CHROMATOGRAPHY
8	COMBUSTION
8	PROCESS SIMULATION
8	PROCESS SIMULATION, PHYSICOCHEMICAL
7	HYDROCARBONS
7	PETROLEUM REFINING <b>RESIDUES</b>
7	<b>64-17-5</b>
6	CHROMATOGRAPHY, GAS
6	<b>71-43-2</b>
5	ALCOHOLS
5	<b>COAL LIQUEFACTION</b>
5	EXHAUST <b>GASES</b>
5	FUELS, DIESEL
5	GEOLOGICAL SEDIMENTS
5	NATURAL GAS
5	PETROLEUM PRODUCTS
5	<b>124-38-9</b>
5	<b>1333-74-0</b>
5	<b>630-08-0</b>
5	<b>67-56-1, USES AND MISC</b>
5	<b>71-36-3</b>
4	<b>ALKENES</b>
4	AROMATIC HYDROCARBONS
4	<b>COAL GASIFICATION</b>
4	MASS SPECTROSCOPY
4	PETROLEUM PROSPECTING
4	PETROLEUM RECOVERY, BY FLOODING
4	THERMAL DECOMPOSITION
4	<b>119-64-2</b>
4	<b>67-64-1</b>
4	<b>74-85-1</b>
4	<b>74-85-1, PREPN</b>
4	<b>75-65-0</b>
4	<b>7704-34-9</b>
3	ALKANES
3	<b>ALKENES, PREPN</b>
3	AROMATIC HYDROCARBONS, ANAL
3	CHROMATOGRAPHY, COLUMN AND LIQUID
3	<b>COAL LIQUEFACTION, HYDRO-</b>
3	<b>COKE</b>
3	EXHAUST <b>GASES, DIESEL</b>
3	FLOW
3	<b>HYDROCARBONS, USES AND MISC</b>
3	LUBRICATING OIL ADDITIVES
3	LUBRICATING OILS
3	OILS
3	ORGANIC <b>MATTER</b>
3	OXIDATION CATALYSTS
3	PETROLEUM RECOVERY, ENHANCED
3	PETROLEUM REFINING CATALYSTS
3	PETROLEUM REFINING, CRACKING
3	PETROLEUM WELLS



**Fig. 2** T+1 = 1986-1990

PROG:

THERE ARE 274 UNIQUE VALUES.

OCCURRENCES

TERM

10	PETROLEUM RECOVERY
9	PETROLEUM REFINING
7	PETROLEUM RESERVOIRS
5	AROMATIC HYDROCARBONS
5	LUBRICATING OILS
5	PETROLEUM
5	PETROLEUM REFINING CATALYSTS
4	FLOW
4	PETROLEUM RECOVERY, BY FLOODING
4	PROCESS SIMULATION
4	PROCESS SIMULATION, PHYSICOCHEMICAL
4	<b>64-17-5</b>
3	ADSORPTION
3	ALKANES
3	ASPHALTENES
3	HYDROCARBONS
3	NATURAL GAS
3	PETROLEUM REFINING <b>RESIDUES</b>
3	<b>124-38-9</b>
3	<b>64-17-5, PREPN</b>
2	ALCOHOLS
2	<b>ALKENES</b>
2	CATALYSTS AND CATALYSIS
2	COMBUSTION
2	FLUIDIZATION
2	GAS OILS
2	<b>GASOLINE</b>
2	GEOLOGICAL SEDIMENTS
2	HEAT TRANSFER
2	HYDROCARBONS, <b>PROP</b>
2	HYDROGENATION CATALYSTS
2	LUBRICATING OIL ADDITIVES
2	METALS
2	METALS, USES AND MISC
2	PERMEABILITY AND PERMEATION
2	PETROLEUM RECOVERY, <b>BY FLOODING, WATERFLOOD</b>
2	PETROLEUM REFINING CATALYSTS, HYDROPROCESSING
2	PIPES AND TUBES
2	PLASTICS
2	RUBBER
2	RUBBER, SYNTHETIC, THERMOPLASTIC
2	SEDIMENTARY ROCKS
2	SURFACTANTS
2	WASTE <b>GASES</b>
2	<b>124-38-9, USES AND MISC</b>
2	<b>67-56-1</b>
2	<b>7440-02-0</b>
2	<b>7440-02-0, USES AND MISC</b>
2	<b>7446-09-5</b>
2	<b>7446-09-5, USES AND MISC</b>
2	<b>7783-06-4</b>
2	<b>9016-45-9</b>
1	AIR POLLUTION
1	ALCOHOLS, ETHOXYLATED, COMPOUNDS
1	<b>ALCOHOLS, PREPN</b>
1	ALKANES, ANAL
1	ALKANES, PREPN, <b>C1-5</b>
1	ALKANES, PREPN, <b>C6-13</b>
1	ALKANES, USES AND MISC
1	<b>ALKENES, PREPN</b>

----- Fig. 3 -----

Comparaison Rev.IFP 86-90 avec 81-85 sur IT C.A.S. 27/02/90

67 165

Terms common to files: **ifpit869** and **ifpit818**

Terms from file: **ifpit869** are printed first. Key= 30

-----

10	PETROLEUM RECOVERY
12	PETROLEUM RECOVERY
9	PETROLEUM REFINING
20	PETROLEUM REFINING
7	PETROLEUM RESERVOIRS
2	PETROLEUM RESERVOIRS
5	AROMATIC HYDROCARBONS
4	AROMATIC HYDROCARBONS
5	LUBRICATING OILS
3	LUBRICATING OILS
5	PETROLEUM
11	PETROLEUM
5	PETROLEUM REFINING CATALYSTS
3	PETROLEUM REFINING CATALYSTS
4	FLOW
3	FLOW
4	PETROLEUM RECOVERY, BY FLOODING
4	PETROLEUM RECOVERY, BY FLOODING
4	PROCESS SIMULATION
8	PROCESS SIMULATION
4	PROCESS SIMULATION, PHYSICOCHEMICAL
8	PROCESS SIMULATION, PHYSICOCHEMICAL
4	64-17-5
7	64-17-5
3	ALKANES
3	ALKANES
3	ASPHALTENES
10	ASPHALTENES
3	HYDROCARBONS
7	HYDROCARBONS
3	NATURAL GAS
5	NATURAL GAS
3	PETROLEUM REFINING <b>RESIDUES</b>
7	PETROLEUM REFINING <b>RESIDUES</b>
3	124-38-9
5	124-38-9
3	64-17-5, PREPN
2	64-17-5, PREPN
2	ALCOHOLS
5	ALCOHOLS
2	<b>ALKENES</b>
4	<b>ALKENES</b>
2	CATALYSTS AND CATALYSIS
8	CATALYSTS 'AND CATALYSIS
2	COMBUSTION
8	COMBUSTION
2	<b>GASOLINE</b>
9	<b>GASOLINE</b>
2	GEOLOGICAL SEDIMENTS
5	GEOLOGICAL SEDIMENTS
2	LUBRICATING OIL ADDITIVES
3	LUBRICATING OIL ADDITIVES
2	METALS
2	METALS

Index Terms Nouveaux dans Rev.IFP (86-90/81-85)

Terms from file: **ifpit869** with no equivalent in  
file: **IFPIT818** are printed. Key = 30

-----

3	ADSORPTION
2	FLUIDIZATION
2	GAS OILS
2	HEAT TRANSFER
2	HYDROCARBONS, <b>PROP</b>
2	HYDROGENATION CATALYSTS
2	PIPES AND TUBES
2	RUBBER, SYNTHETIC, THERMOPLASTIC
2	WASTE <b>GASES</b>
2	9016-45-9
1	ALCOHOLS, ETHOXYLATED, COMPOUNDS
1	ALKANES, PREPN, C1-5
1	ALKANES, PREPN, C6-13
1	ALKANES, USES AND MISC
1	<b>ALKENES</b> , PREPN, C2-4
1	ALKYNES
1	ALKYNES, C3-4
1	ANALYSIS
1	ANALYSIS, BIOCHEM.
1	AROMATIC HYDROCARBONS, C6-13
1	AROMATIC HYDROCARBONS, OCCURRENCE
1	AROMATIC HYDROCARBONS, PREPN
1	<b>BACTERIA</b>
1	BITUMINOUS MATERIALS
1	BITUMINOUS MATERIALS, RESINS
1	<b>CARBON</b> BLACK
1	<b>CARBON</b> BLACK, USES AND MISC
1	<b>CARBON FIBERS</b>
1	<b>CARBON FIBERS</b> , USES AND MISC
1	CERAMIC MATERIALS AND WARES
1	CHAINS
1	CHAINS, CHEMICAL, NETWORK, INTERPENETRATING
1	CLAYS, OCCURRENCE
1	CLIMATE
1	CLIMATE, GREENHOUSE EFFECT
1	COALESCENCE
1	COMBUSTION, FLUIDIZED-BED
1	CORROSION
1	CORROSION, <b>BIO-</b>
1	CRYSTALLITES
1	CRYSTALLIZATION
1	CYCLOALKANES
1	DEHYDROGENATION
1	DEHYDROGENATION <b>CATALYSTS</b>
1	DROPS
1	ENERGY
1	EQUATION OF STATE
1	EQUILIBRIUM
1	EQUILIBRIUM, PHASE
1	ESTERIFICATION
1	FLAHE
1	FLAME, TURBULENT, PREMIXED
1	FLOW, <b>GAS-LIQ.</b>
1	FLOW, TURBULENT







**Fig. 8**

.....  
 Comparaison de **GET** de Rabat (100) a celui de **Marseille** (100)

Data from file **rabat.get** are printed **first**.

Number of characters compared: 5      Date: 12-81-1980  
 -----

<b>occur.</b>	<b>terms</b>	<b>occur.</b>	<b>terms</b>	
3	<b>DILS</b>	a	9	<b>DILS</b>
2	<b>CRYSTAL STRUCTURE</b>	a	6	<b>CRYSTAL STRUCTURE</b>
2	<b>HEAT TRANSFER</b>	†	7	<b>HEAT OF ALLDYING</b>
2	<b>HEAT TRANSFER</b>	a	5	<b>HEAT OF FORMATION</b>
2	<b>7439-89-6</b>	a	10	<b>7439-89-6</b>
2	<b>7439-89-6</b>	†	9	<b>7439-92-1</b>
2	<b>7439-89-6</b>	a	7	<b>7439-95-4</b>
2	<b>7440-22-4</b>	a	11	<b>7440-44-0</b>
2	<b>7440-22-4</b>	†	10	<b>7440-50-8</b>
2	<b>7440-22-4</b>	a	9	<b>7440-21-3</b>
2	<b>7440-22-4</b>	†	9	<b>7440-22-4</b>
2	<b>7440-22-4</b>	a	9	<b>7440-70-2</b>
2	<b>7440-22-4</b>	a	7	<b>7440-66-6</b>
2	<b>7440-22-4</b>	a	7	<b>7440-70-2, BIOL STUDY</b>
2	<b>7440-22-4, PRDP</b>	†	11	<b>7440-44-0</b>
2	<b>7440-22-4, PRDP</b>	a	10	<b>7440-50-8</b>
2	<b>7440-22-4, PRDP</b>	†	9	<b>7440-21-3</b>
2	<b>7440-22-4, PRDP</b>	†	9	<b>7440-22-4</b>
2	<b>7440-22-4, PRDP</b>	a	9	<b>7440-70-2</b>
2	<b>7440-22-4, PRDP</b>	†	7	<b>7440-66-6</b>
2	<b>7440-22-4, PRDP</b>	†	7	<b>7440-70-2, BIOL STUDY</b>
2	<b>7440-50-8</b>	a	11	<b>7440-44-0</b>
2	<b>7440-50-8</b>	†	10	<b>7440-50-8</b>
2	<b>7440-50-8</b>	†	9	<b>7440-21-3</b>
2	<b>7440-50-8</b>	†	9	<b>7440-22-4</b>
2	<b>7440-50-8</b>	a	9	<b>7440-70-2</b>
2	<b>7440-50-8</b>	†	7	<b>7440-66-6</b>
2	<b>7440-50-8</b>	†	7	<b>7440-70-2, BIOL STUDY</b>
1	<b>CARBONIZATION AND COKING</b>	†	6	<b>CARBOHYDRATES AND SUGARS</b>
1	<b>ENERGY LEVEL</b>	†	7	<b>ENERGY LEVEL</b>
1	<b>FLOW</b>	a	8	<b>FLOW</b>
1	<b>HEAT OF RECRYSTALLIZATIOI</b>	†	7	<b>HEAT OF ALLOYING</b>
1	<b>HEAT OF RECRYSTALLIZATIO</b>	†	5	<b>HEAT OF FORMATION</b>
1	<b>HOLECULAR CENTRIFUGAL DI</b>	†	6	<b>HOLECULAR CLONING</b>
1	<b>HOLECULAR ORIENTATION</b>	†	6	<b>HOLECULAR CLONING</b>
1	<b>HOLECULAR ORIENTATION, R</b>	†	6	<b>HDLECULAR CLONING</b>
1	<b>HOLECULAR ROTATION</b>	†	6	<b>HOLECULAR CLONING</b>
1	<b>HOLECULAR VIBRATION</b>	†	6	<b>HOLECULAR CLONING</b>
1	<b>NUCLEAR MAGNETIC RESONAN</b>	†	6	<b>NUCLEAR MAGNETIC RESONAN</b>
1	<b>OIIDATION</b>	†	6	<b>OIIDATION</b>
1	<b>OIIDATION, ELECTROCHEMIC</b>	†	6	<b>OIIDATION</b>
1	<b>PHOSPHATES</b>	†	8	<b>PHOSPHOLIPIDS</b>
1	<b>PHOSPHATES</b>	†	7	<b>PHOSPHOLIPIDS, BIOL STUD</b>
1	<b>PHOSPHATES, OCCURRENCE</b>	†	8	<b>PHOSPHOLIPIDS</b>
1	<b>PHOSPHATES, OCCURRENCE</b>	†	7	<b>PHOSPHOLIPIDS, BIOL STUD</b>

-----

**Fig. 9**

.....  
 Comparaison du **GET** de Rabat (100) a celui de Geneve (100)

Data froi file **rabat.get** are printed first.

Number of characters coipared: 5      Date: 12-01-1988

---

occur.	terms		occur.	terms
2	CRYSTAL STRUCTURE	t	20	CRYSTAL STRUCTURE
2	HEAT TRANSFER	t	13	HEAT CAPACITY
2	7440-22-4	t	23	7440-70-2
2	7440-22-4	t	21	7440-70-2, BIOL STUDY
2	7440-22-4	‡	8	7440-23-5
2	7440-22-4	t	6	7440-09-7
2	7440-22-4	t	6	7440-23-5, BIOL STUDY
2	7440-22-4, PROP	t	23	7440-70-2
2	7440-22-4, PROP	t	21	7440-70-2, BIOL STUDY
2	7440-22-4, PROP	t	8	7440-23-5
2	7440-22-4, PROP	t	6	7440-09-7
2	7440-22-4, PROP	t	6	7440-23-5, BIOL STUDY
2	7440-50-8	t	23	7440-70-2
2	7440-50-8	t	21	7440-70-2, BIOL STUDY
2	7440-50-8	‡	8	7440-23-5
2	7440-50-8	t	6	7440-09-7
2	7440-50-8	t	6	7440-23-5, BIOL STUDY
1	ELECTRIC CONDUCTIVITY AN‡		6	ELECTRON BEAM
1	ELECTRIC CONDUCTIVITY AN‡		6	ELECTRUN SPIN RESONANCE
1	ELECTRIC CURRENT	t	6	ELECTRON BEAM
1	ELECTRIC CURRENT	t	6	ELECTRON SPIN RESONANCE
1	ELECTRON CONFIGURATION	t	6	ELECTRON BEAM
1	ELECTRON CONFIGURATION	t	6	ELECTRON SPIN RESUNANCE
1	ENERGY LEVEL	‡	10	ENERGY LEVEL
1	HEAT DF RECRYSTALLIZATIO‡		13	HEAT CAPACITY
1	HOLECULAR CENTRIFUGAL DI‡		10	HOLECULAR STRUCTURE
1	HOLECULAR CENTRIFUGAL DIt		8	HOLECULAR CLONING
1	HOLECULAR CENTRIFUGAL DIt		7	HOLECULAR ORBITAL
1	HOLECULAR ORIENTATION	t	10	HOLECULAR STRUCTURE
1	HOLECULAR ORIENTATION	t	8	HOLECULAR CLONING
1	HOLECULAR ORIENTATION	t	7	HOLECULAR ORBITAL
1	HOLECULAR ORIENTATION, Rt		10	HOLECULAR STRUCTURE
1	HOLECULAR ORIENTATION, Rt		8	HOLECULAR CLONING
1	HOLECULAR ORIENTATION, Rt		7	HOLECULAR ORBITAL
1	HOLECULAR ROTATION	t	10	HOLECULAR STRUCTURE
1	HOLECULAR ROTATION	‡	8	HOLECULAR CLONING
1	HOLECULAR ROTATION	t	7	HOLECULAR ORBITAL
1	HOLECULAR VIBRATION	‡	10	HOLECULAR STRUCTURE
1	HOLECULAR VIBRATION	t	8	HOLECULAR CLONING
1	HOLECULAR VIBRATION	‡	7	HOLECULAR ORBITAL
1	EUANTUH CHEHISTRY	t	6	QUANTUH CHEHISTRY
1	QUANTUM CHEHISTRY	t	6	QUANTUH CHROHODYNAHICS
1	EUANTUH CHEHISTRY, CI	t	6	QUANTUH CHEHISTRY
1	QUANTUH CHEHISTRY, CI	t	6	QUANTUH CHROHODYNELHICS
1	QUANTUH ELECTRUDYNAMICS	t	6	QUANTUH CHEHISTRY
1	QUANTUM ELECTRODYNAMICS ‡		6	QUANTUM CHROHODYNAHICS

---



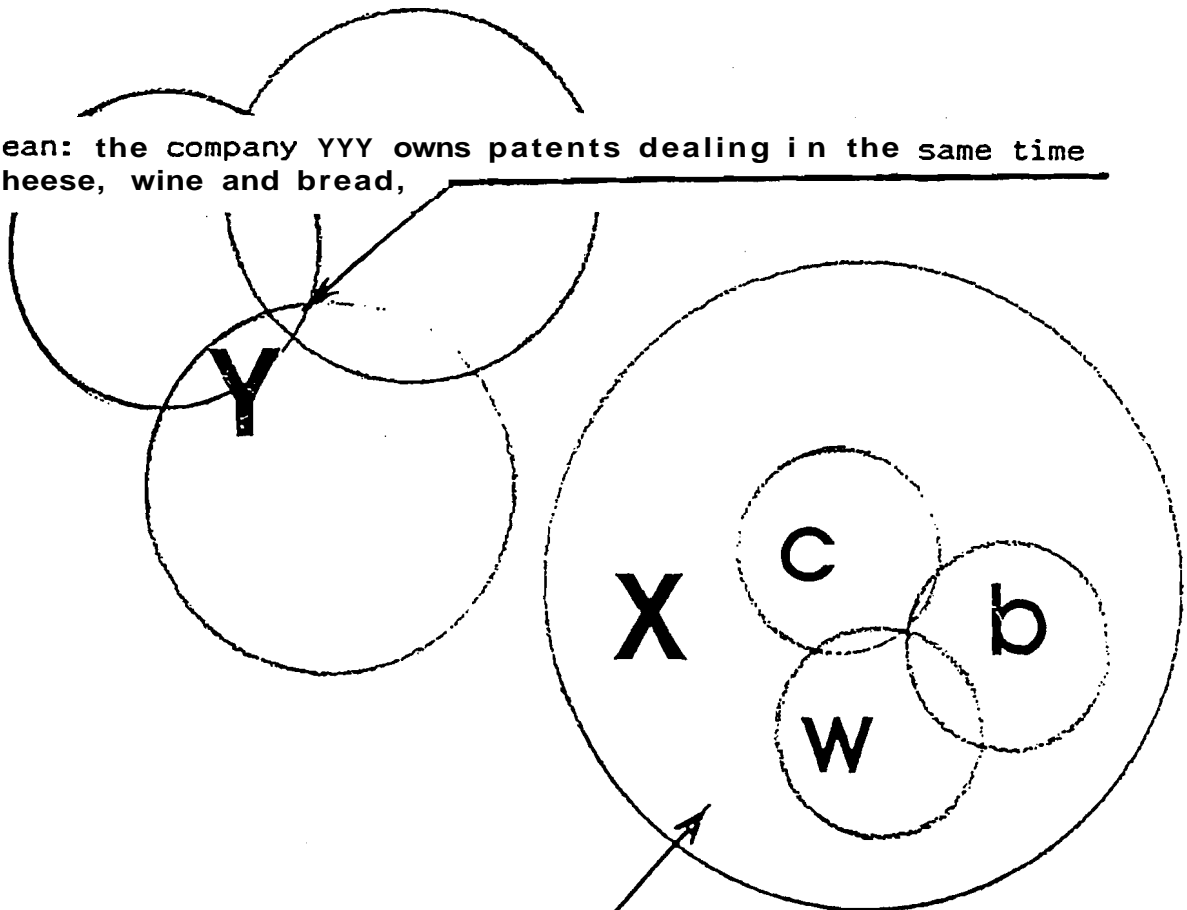
**Fig. 10 STRATEGIC CLUSTERS FROM NON  
BOOLEAN SEARCHES**

**GOAL: Extract Patent Assignees  
concerned by WINE, BREAD, CHEESE  
Years 1988 - 1989**

Example: Patentee XXXX has four patents, 1 with bread, 1 with wine, and two with cheese.

This question cannot be solved with Boolean logic !!!

Boolean: the company YYY owns patents dealing in the same time by cheese, wine and bread,



Non Boolean: the company XXX owns patents dealing with cheese, wine and bread or any combinations of the three.

ELAPSED TIME ON ORBIT: 0.02 HRS.  
YOU ARE NOW CONNECTED TO THE WPI LATEST DATABASE.  
COVERS BASICS 1981 - DATE: UPDATED TO  
8940/UP;8940/UPEQ,8927/UPA,8912/UPB.

Fig. 11

SS 1 /C?

USER:

~bread# and wine# and cheese#

PROG:

SS 1 PSTG (1)

SS 2 /C?

USER:

~prt

PROG:

-1-

AN - 88-096323/14

XRAM- C88-043414

TI - Rat attractant - contains alcohol e.g. sake, wine  
etc. irnpregnated into food

DC - C03 P14

PA - (MURA/) MURAKAMI H

NP - 2

PN - 563048205-A 88.02.29 (8814) {JP}

CN8704002-A 88.02.10 (8913)

PR - 86.08.19 86JP-193677 86.06.03 86JP-U84682 86.06.10

86JP-135192 86.07.30 86JP-V17378

AP - 86.08.19 86JP-193677

SS 2 /C?

USER:

~wine# or bread# or cheese#

PROG:

SS 2 PSTG (7568)

PROG :

SS 2: WINE# (2390)

SS 3: 2 AND 88-89 (494) ←

SS 4: BREAD# (2800)

SS 5: 4 AND 88-89 (691) ←

SS 6: CHEESE# (2496)

SS 7: 6 AND 88-89 (569) ←

SS 8 /C?

USER :

~

Fig. 12 HOW TO SOLVE THE PROBLEM:

SS a /C?  
USER:  
~bread#

PROG:  
SS 8 PSTG (2800)

SS 9 /C?  
USER:  
~cheese#

PROG:  
SS 9 PSTG (2496)

SS 10 /C?  
USER:  
~wine#

PROG:  
SS 10 PSTG (2390)

SS 11 /C?  
USER:  
~8 and 88-89

PROG:  
SS 11 PSTG (691)      -----> GET PA RANK TOP 1000 --> 511 PA

SS 12 /C?  
USER:  
~9 and 88-89

PROG:  
SS 12 PSTG (569)      -----> GET PA RANK TOP 1000 --> 444 PA

SS 13 /C?  
USER:  
~10 and 88-89

PROG:  
SS 13 PSTG (494)      -----> GET PA RANK TOP 1000 --> 479 PA

**GET**

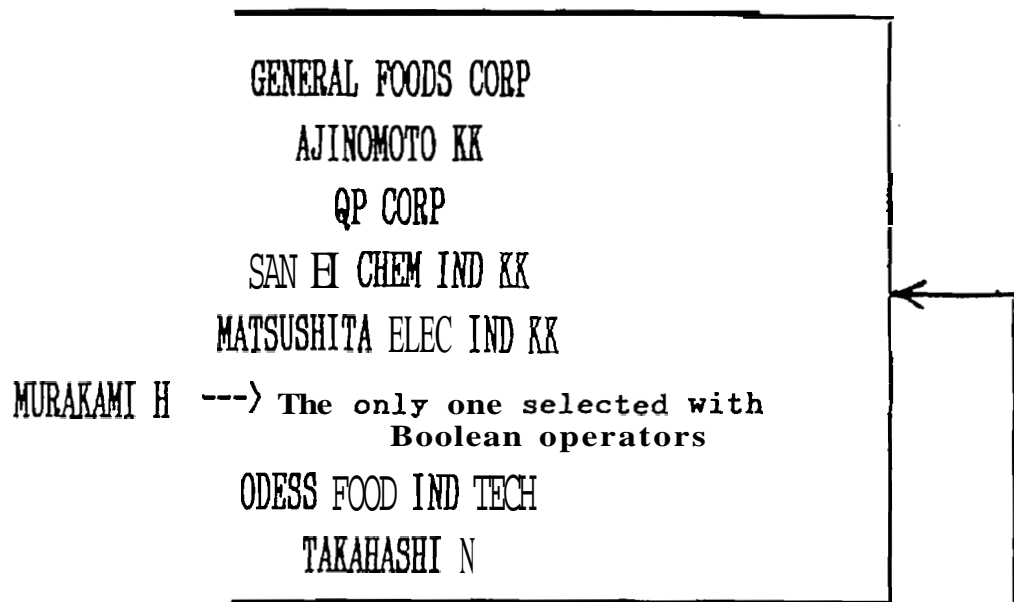
Comparison of GETWINE and GETBREAD (WPIL PA 12/06/1989)

Terms common to files: getwine and getbread

Terms from file: getwine are printed first. Key= 20

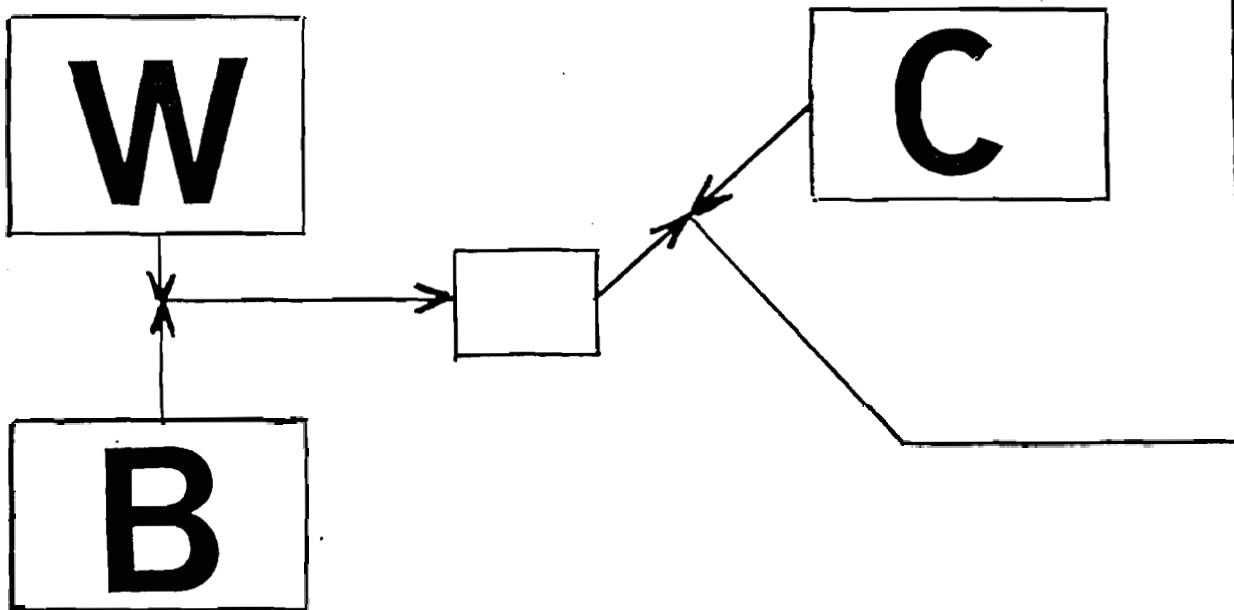
4 TAKEDA CHEMICAL IND KK  
1 TAKEDA CHEMICAL IND KK  
3 QP CORP  
1 QP CORP  
3 TOPPAN PRINTING KK  
1 TOPPAN PRINTING KK  
2 HEINEKEN TEC BEHEER NV  
1 HEINEKEN TEC BEHEER NV  
2 JGC CORP  
1 JGC CORP  
2 KIKKOMAN CORP  
4 KIKKOMAN CORP  
2 MATSUSHITA ELEC IND KK  
12 MATSUSHITA ELEC IND KK  
2 MOSC FOOD IND TECHN  
7 MOSC FOOD IND TECHN  
1 AJINOMOTO KK  
4 AJINOMOTO KK  
1 AS SIBE IRKUT ORG CHEM  
1 AS SIBE IRKUT ORG CHEM  
1 GENERAL FOODS CORP  
2 GENERAL FOODS CORP  
1 HOUSE SHOKUHIN KOGY  
2 HOUSE SHOKUHIN KOGY  
1 LIVE INT KK  
1 LIVE INT KK  
1 MAGARACH WINE PROD  
1 MAGARACH WINE PROD  
1 MURAKAMI H  
1 MURAKAMI H  
1 ODESS FOOD IND TECH  
1 ODESS FOOD IND TECH  
1 SAN EI CHEM IND KK  
1 SAN EI CHEM IND KK  
1 SAPPORO BREWERIES  
4 SAPPORO BREWERIES  
1 SHOWA DENKO KK  
1 SHOWA DENKO KK  
1 TAKAHASHI N  
1 TAKAHASHI N  
1 TAKASAGO INT CORP  
1 TAKASAGO INT CORP

**Fig. 14 COMPANIES OWNING PATENTS DEALING WITH BREAD, WINE, CHEESE,  
BUT NOT NECESSARILY IN THE SAME PATENT !**



The cluster of height companies is large enough to retrieve their patents and to analyze their strategies.

From WPIL, Decembre 6 1989 - years 1988-1989



**Fig. 15**

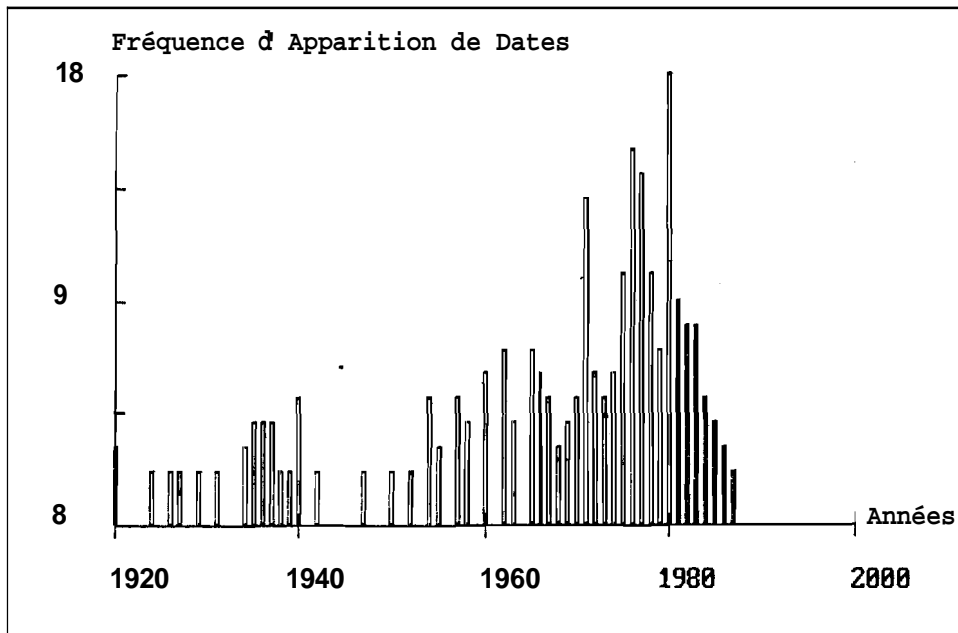
Pots de "type Riviera"

<b>Pays :</b>	<b>Pourcentage des</b>	<b>252 brevets cités</b>
US	76.59%	
DE	9.52%	
FR	5.56%	
GE	2.78%	
CH	1.19%	
SE	0.79%	
FI	0.79%	
IN	0.79%	
JP	0.40%	
NL	0.40%	
EP	0.40%	
AU	0.40%	
SU	0.40%	

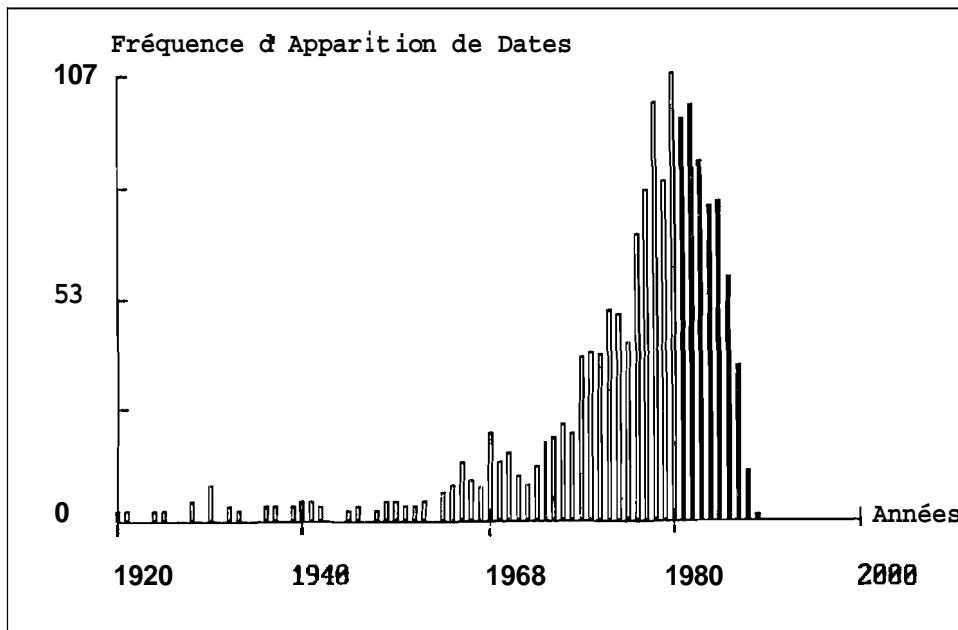
Fibres de Carbone (application spaciales)

<b>Pays :</b>	<b>Pourcentage des</b>	<b>1501 brevets cités</b>
US	76.22%	
JP	6.46%	
DE	5.20%	
GB	4.73%	
FR	3.00%	
EP	1.93%	
SU	0.53%	
CH	0.53%	
CA	0.47%	
AU	0.20%	
DD	0.20%	
WO	0.13%	
SE	0.13%	
NO	0.07%	
IT	0.07%	
NL	0.07%	
BE	0.07%	

Fig. 16

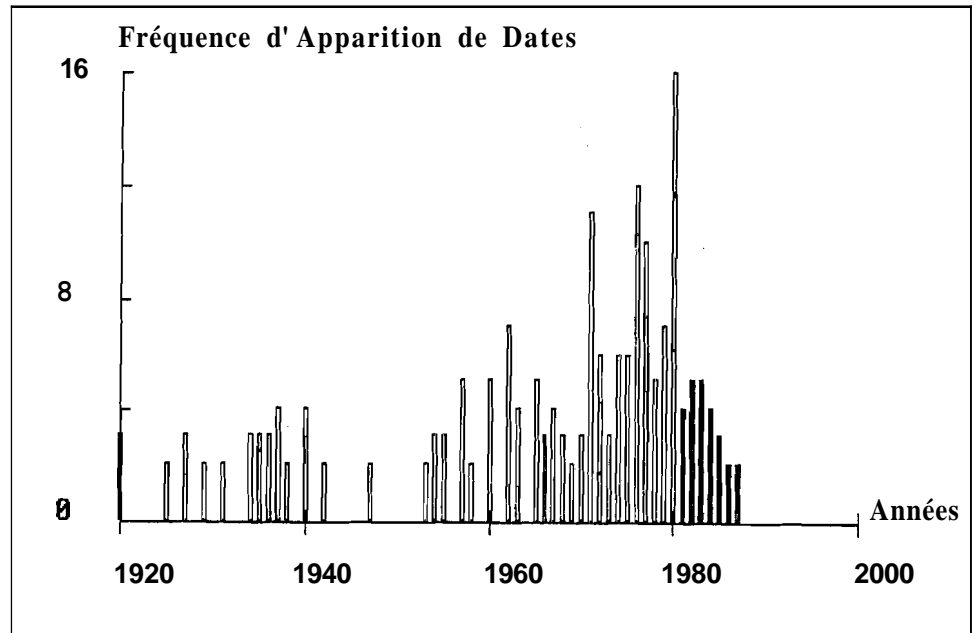


Pots Riviera CT de USPA  
Brevets cités (Tous Pays)

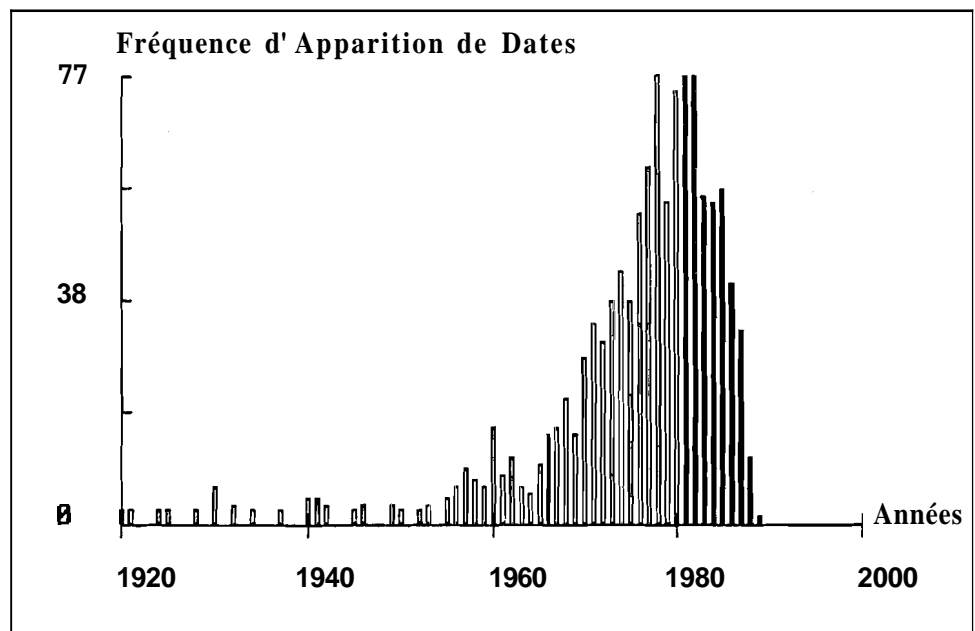


Fibres de Carbone USPA 1990  
Brevets cités (Tous Pays)

Fig. 17



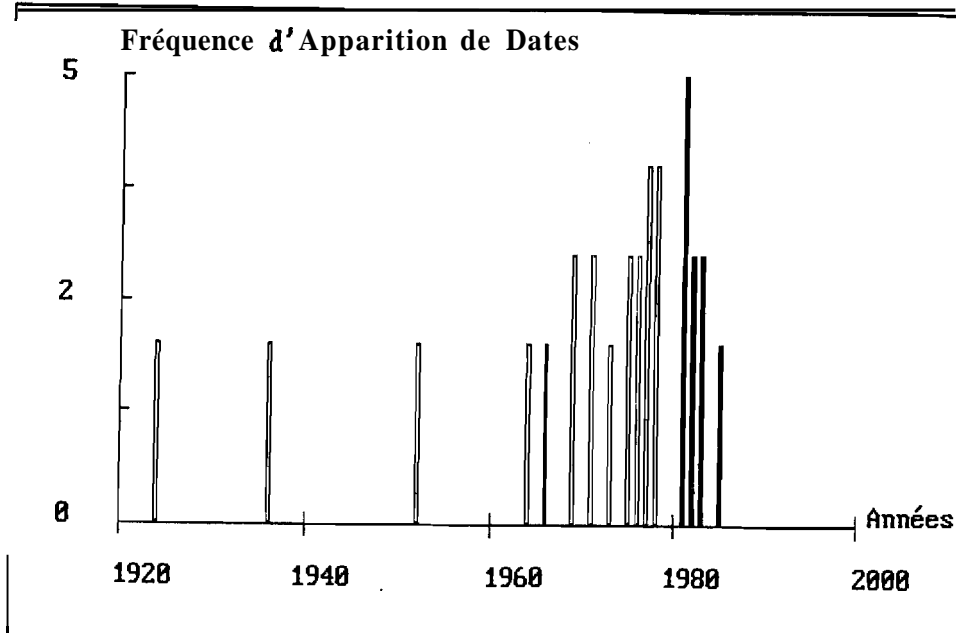
Pots Riviera  
Brevets cités (US) CT de USPA



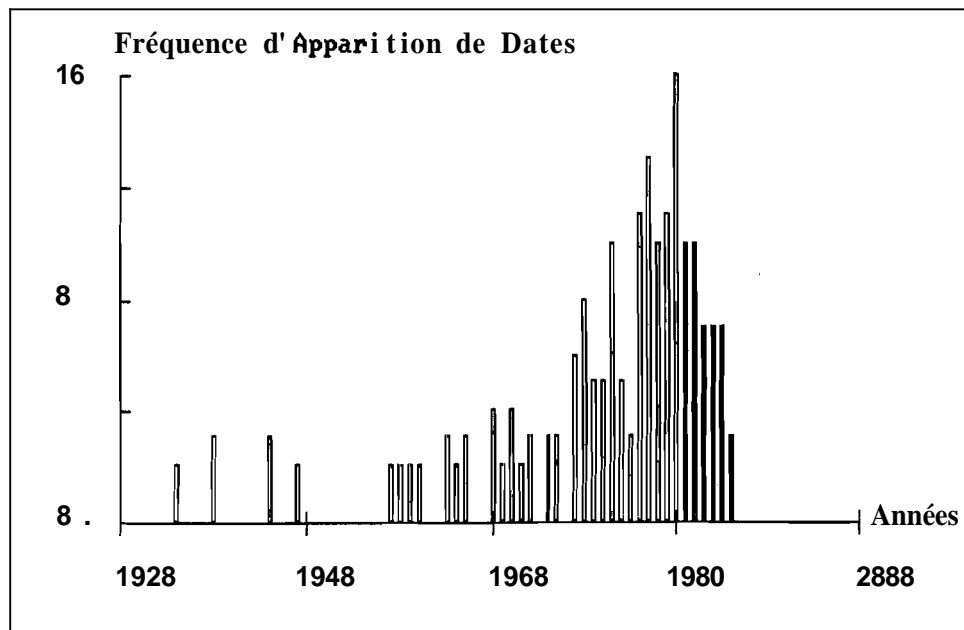
Fibres de Carbone  
Brevets cités (US) USPA 1990



Fig. 18

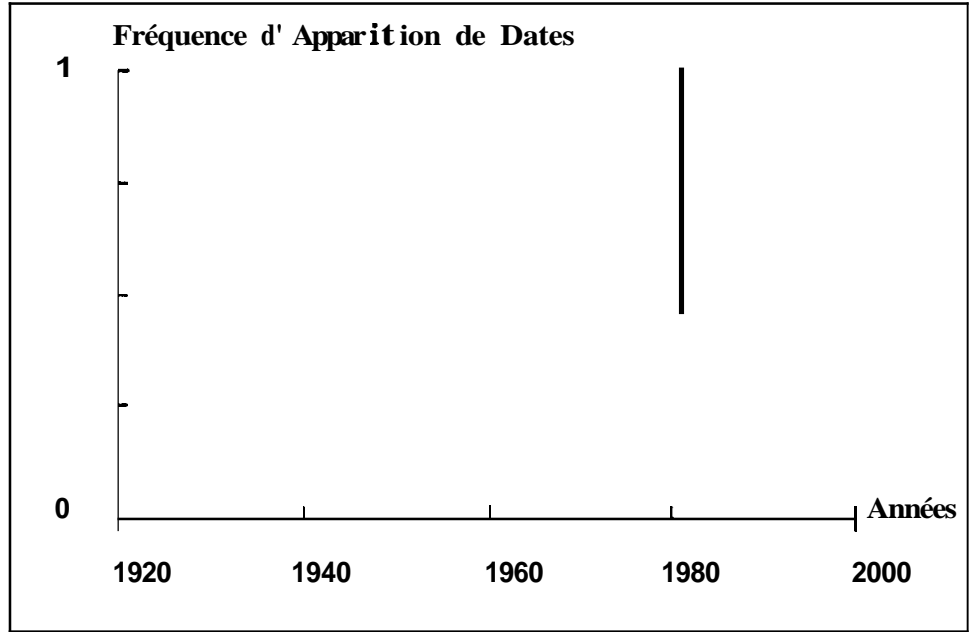


Pots Riviera CT de USA  
Brevets cités (CEE)

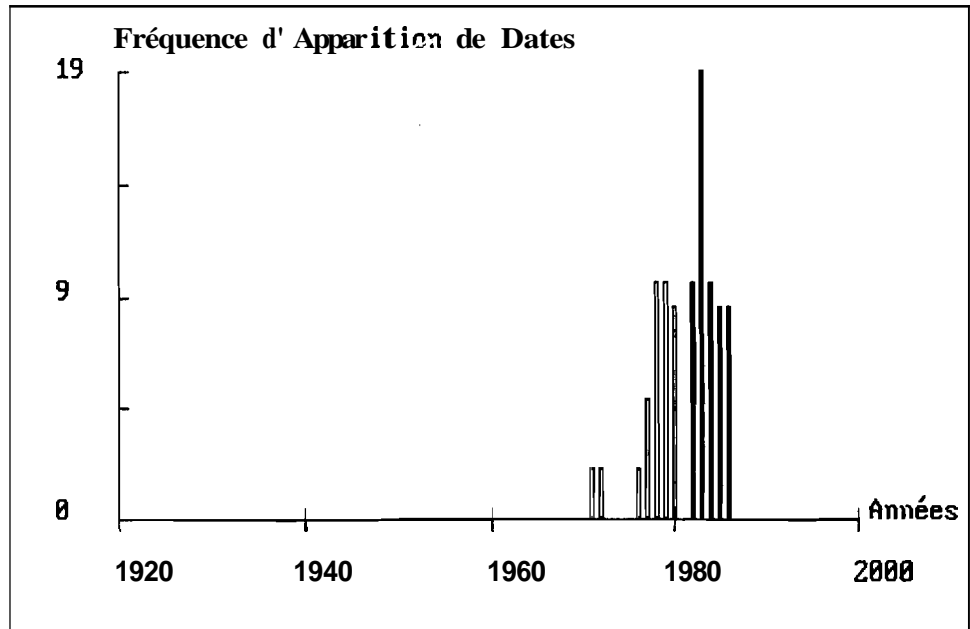


Fibres de Carbone USA 1998  
Brevets cités (CEE)

Fig. 19



Pots Riviera CT de USA  
Brevets cités (JP)



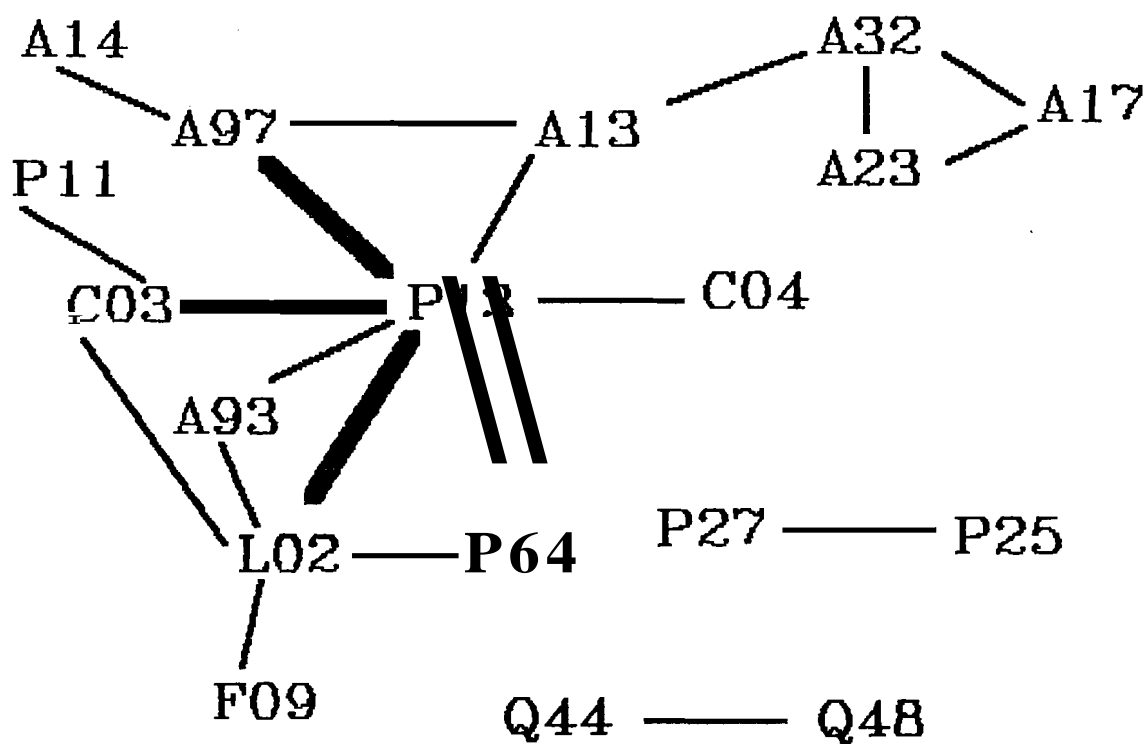
Fibres de Carbone USA 1990  
Brevets cités (JP)

Fig. 20

Inventeur / Société :	Nbre :	Pays :	Premier dépôt :	Dernier dépôt
	24	DE	1940	1986
	14	FR	1935	1984
	7	GB	1924	1985
Arca	4	US	1971	1971
Bressickello	3	US	1972	1972
Krasowski	3	US	1940	1940
	3	CH	1954	1978
Saito	2	US	1984	1985
Kooy	2	US	1984	1984
Shimaoka	2	US	1983	1986
Sukert	2	US	1980	1980
Magee	2	US	1980	1980
Feighan	2	US	1980	1980
Cone	2	US	1980	1980
Bigglestone	2	US	1979	1979
Smith	2	US	1978	1980
Wellman	2	US	1977	1977
Maher	2	US	1976	1976
Harned	2	US	1976	1976
Carlson	2	US	1966	1973
Green	2	US	1965	1973
Matson	2	US	1962	1962
Sobol	2	US	1955	1955
Gabriel	2	US	1936	1936
Friedrich	2	US	1935	1935
Kneller	2	US	1934	1936
	2	SE	1950	1951
	2	IN	1939	1939
	2	AT	1958	1958
Maeda	1	US	1988	
Uehara	1	US	1987	
Scism	1	US	1987	
Forman	1	US	1986	
Collmeyer	1	US	1985	
Bass	1	US	1985	
Qishi	1	US	1984	
Verde	1	US	1983	
Sukonick	1	US	1983	
Sanders	1	US	1983	
Moynihan	1	US	1983	
Strubelt	1	US	1982	
Selby	1	US	1982	
Kulle	1	US	1982	
Frank	1	US	1982	
Burcombe	1	US	1982	
Vidal	1	US	1981	
Geddes	1	US	1981	
English	1	US	1981	
Baumann	1	US	1981	
Schneck	1	US	1980	
Saburi	1	US	1980	
Olsen	1	US	1980	
Horowitz	1	US	1980	
Hollenbach	1	US	1980	
Hickerson	1	US	1980	
Burton	1	US	1980	
Staby	1	US	1979	
Haugen	1	US	1979	

Inventeur / Société :	Nbre :	Pays :	Premier dépôt :	Dernier dépôt
Smith	97	JP	1971	1987
	78	DE	1926	1986
	71	GB	1928	1986
	45	FR	1930	1986
	29	EP	1979	1987
	9	US	1966	1983
	8	SU	1974	1980
	8	CH	1937	1979
	7	US	1976	1984
	7	CA	1957	1980
Homsy	7	US	1985	1989
	6	US	1977	1979
Hagemeister	6	US	1985	1989
Van Auker	6	US	1977	1979
Fukuda	5	US	1984	1987
Beckley	5	US	1981	1983
Yamada	4	US	1985	1986
Shigeta	4	US	1984	1987
Nazem	4	US	1983	1985
Brennan	4	US	1982	1983
Dickakian	4	US	1981	1982
Maistro	4	US	1980	1983
Yates	4	US	1980	1981
Maistre	4	US	1979	1982
McHenry	4	US	1976	1977
Fischer	4	US	1974	1984
Evans	4	US	1974	1977
Clark	4	US	1973	1976
Williams	4	US	1971	1982
King	4	US	1967	1982
Anderson	4	US	1930	1977
Riggs	3	US	1985	1986
Yamatsuta	3	US	1984	1985
Kramer	3	US	1984	1985
Prawo	3	US	1981	1982
Stoven	3	US	1980	1983
Held	3	US	1980	1981
Wood	3	US	1978	1979
Heilman	3	US	1977	1985
Heissler	3	US	1977	1980
Singer	3	US	1977	1977
Kuniya	3	US	1976	1980
Kobayashi	3	US	1976	1980
Lewis	3	US	1976	1976
Figueras	3	US	1976	1976
Thompson	3	US	1974	1987
Munro	3	US	1974	1976
Carlson	3	US	1972	1980
Jenks	3	US	1970	1976
Hochman	3	US	1969	1975
Lee	3	US	1968	1988
Palfreyman	3	US	1968	1972
Hurle	3	US	1968	1970
McCoy	3	US	1965	1972
Bauer	3	US	1962	1976
Scott	3	US	1960	1970
Wilson	3	US	1959	1973
Noland	3	US	1959	1962
Keller	3	US	1950	1986
Davis	3	US	1930	1984

Fig. 22



Pots de Type Riviera (1990)

Base WPI/L

Fréquence > 5

Fréquence < 5

Fig. 23

Chimie Macromoléculaire à Marseille de 1979 à 1987.

Graphe des relations avec les autres sections (CA) de chimie.

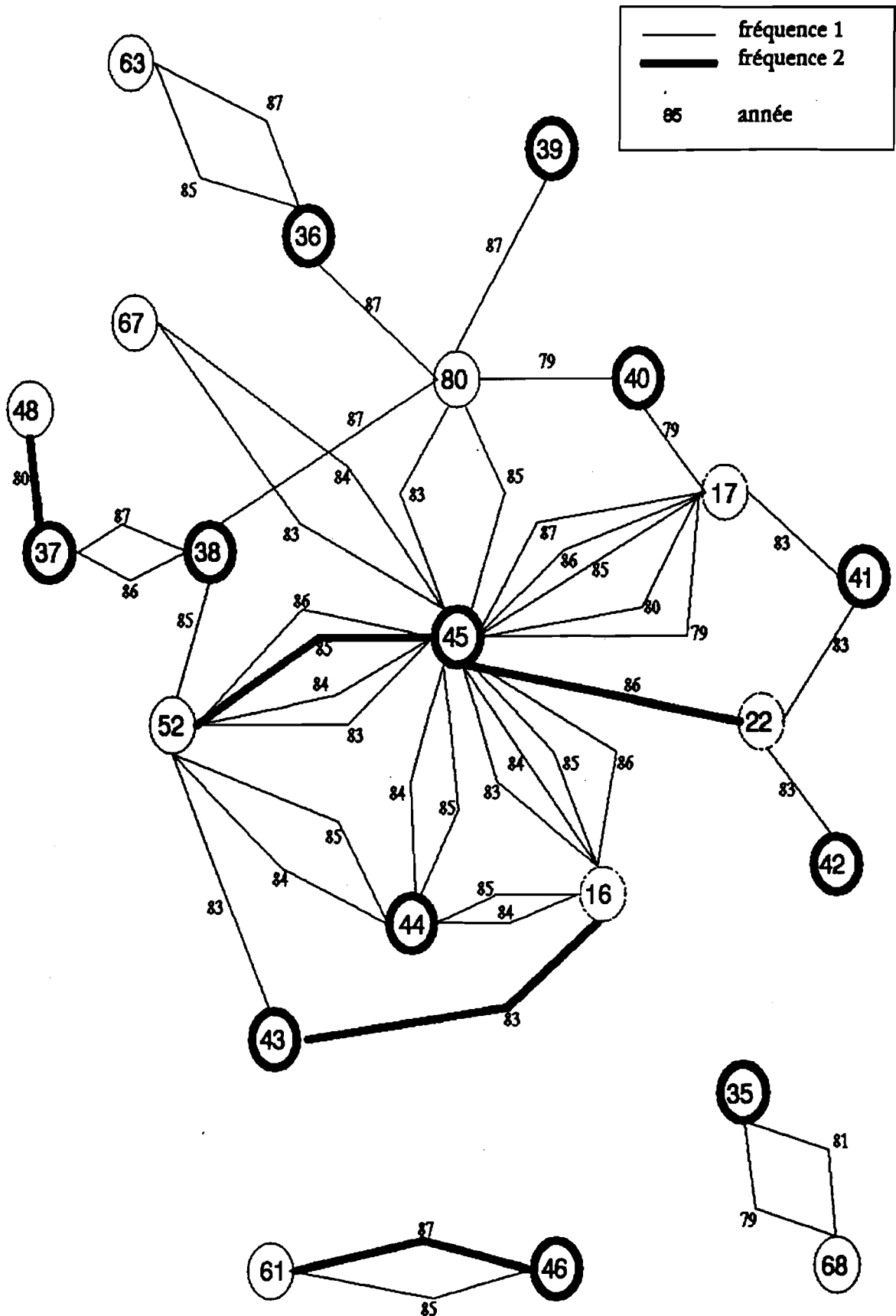


Fig. 24 Correlation matrix obtain with the Principal Components Analysis of French town production in Chemistry

	STRAS	LASC	BREST	CLER	VLON	TBOR	DIJ	MAR	MONT	POI	REN	TOU	PAR	ORS	NIC	GRA	TON
STRAS	1.000																
LASC	0.571	1.000															
BREST	0.242	0.403	1.000														
CLER	0.383	0.335	0.155	1.000													
VLON	0.669	0.718	0.206	0.368	1.000												
TBOR	0.596	0.698	0.487	0.426	0.724	1.000											
DIJ	0.004	0.079	0.034	0.594	0.099	0.118	1.000										
MAR	0.645	0.636	0.306	0.417	0.721	0.642	0.159	1.000									
MONT	0.693	0.658	0.350	0.524	0.655	0.789	0.086	0.719	1.000								
POI	0.172	0.246	0.162	0.235	0.403	0.370	0.078	0.224	0.263	1.000							
REN	0.326	0.449	0.215	0.253	0.392	0.633	0.108	0.341	0.406	0.507	1.000						
TOU	0.558	0.552	0.277	0.454	0.600	0.811	0.146	0.519	0.720	0.322	0.549	1.000					
PAR	0.767	0.443	0.097	0.396	0.687	0.552	0.032	0.653	0.674	0.138	0.249	0.536	1.000				
ORS	0.392	0.598	0.642	0.145	0.519	0.532	0.037	0.555	0.347	0.133	0.345	0.301	0.265	1.000			
NIC	0.503	0.197	0.204	0.226	0.444	0.255	-0.007	0.578	0.380	0.043	0.130	0.239	0.469	0.537	1.000		
GRA	-0.050	0.032	-0.055	0.007	-0.045	-0.024	0.052	0.021	0.073	-0.013	0.045	0.009	-0.033	-0.007	-0.014	1.000	
TON	0.313	0.340	-0.040	0.274	0.375	0.370	0.059	0.322	0.380	0.159	0.134	0.394	0.149	0.081	0.141	0.032	1.000

Fig. 25

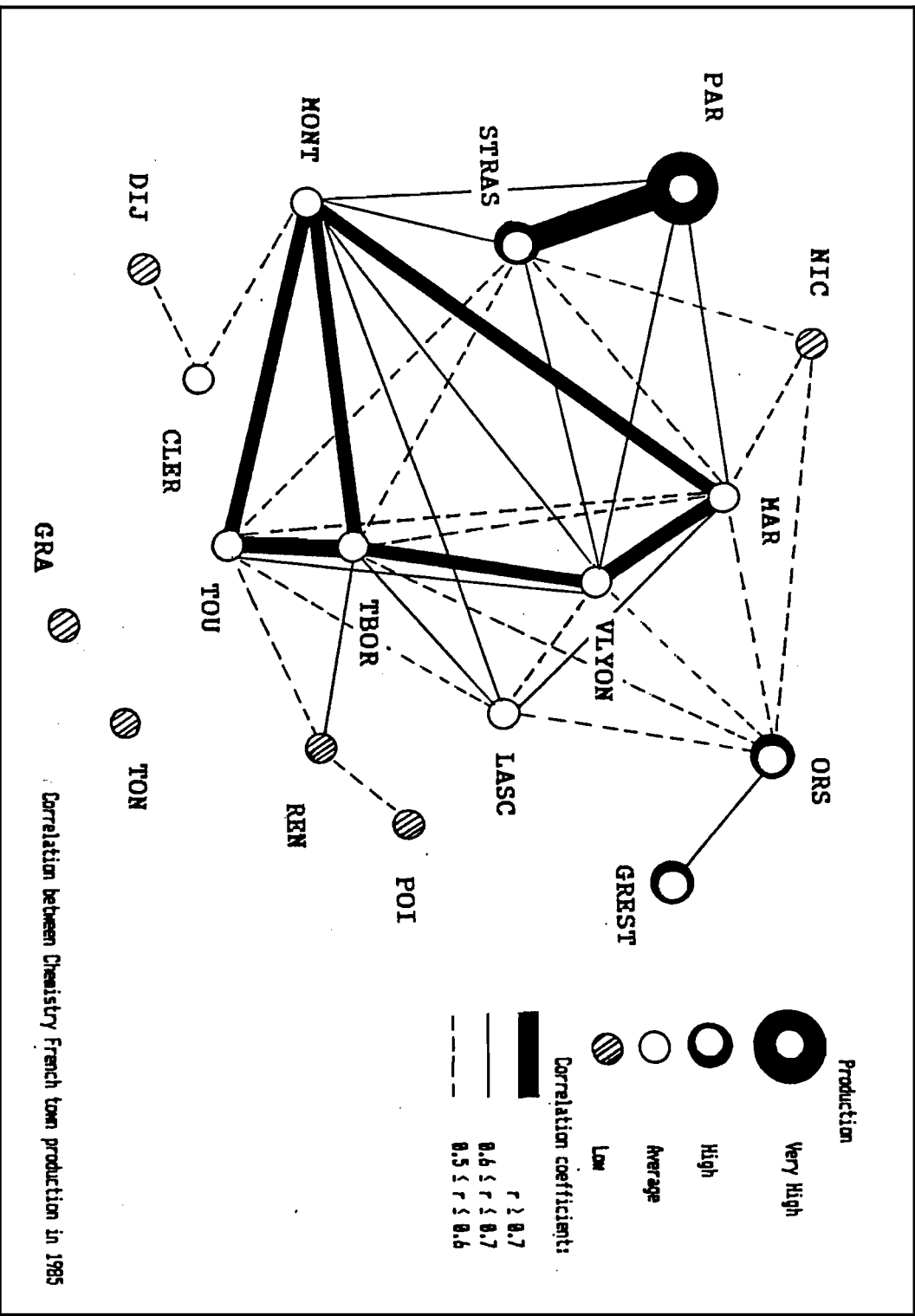
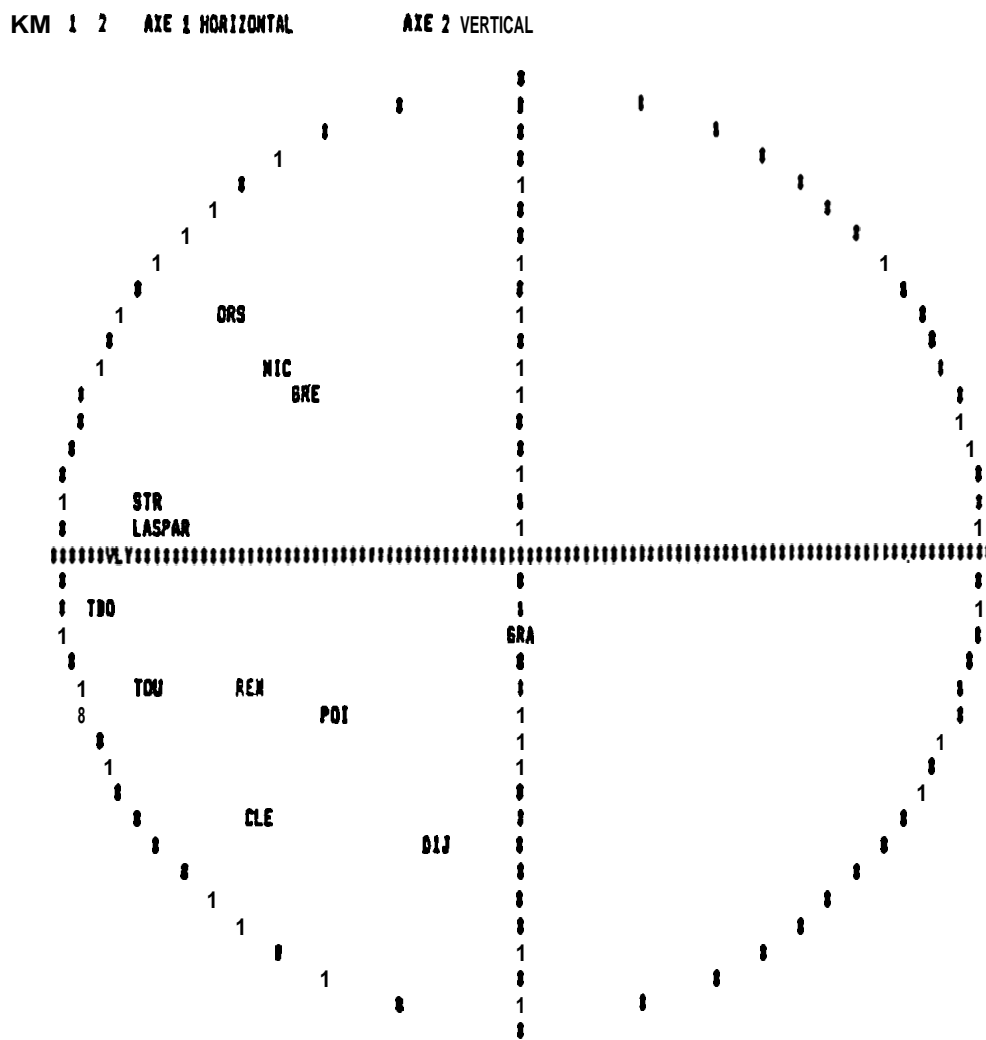




Fig. 26

CERCLE DEI CORRELATIONS

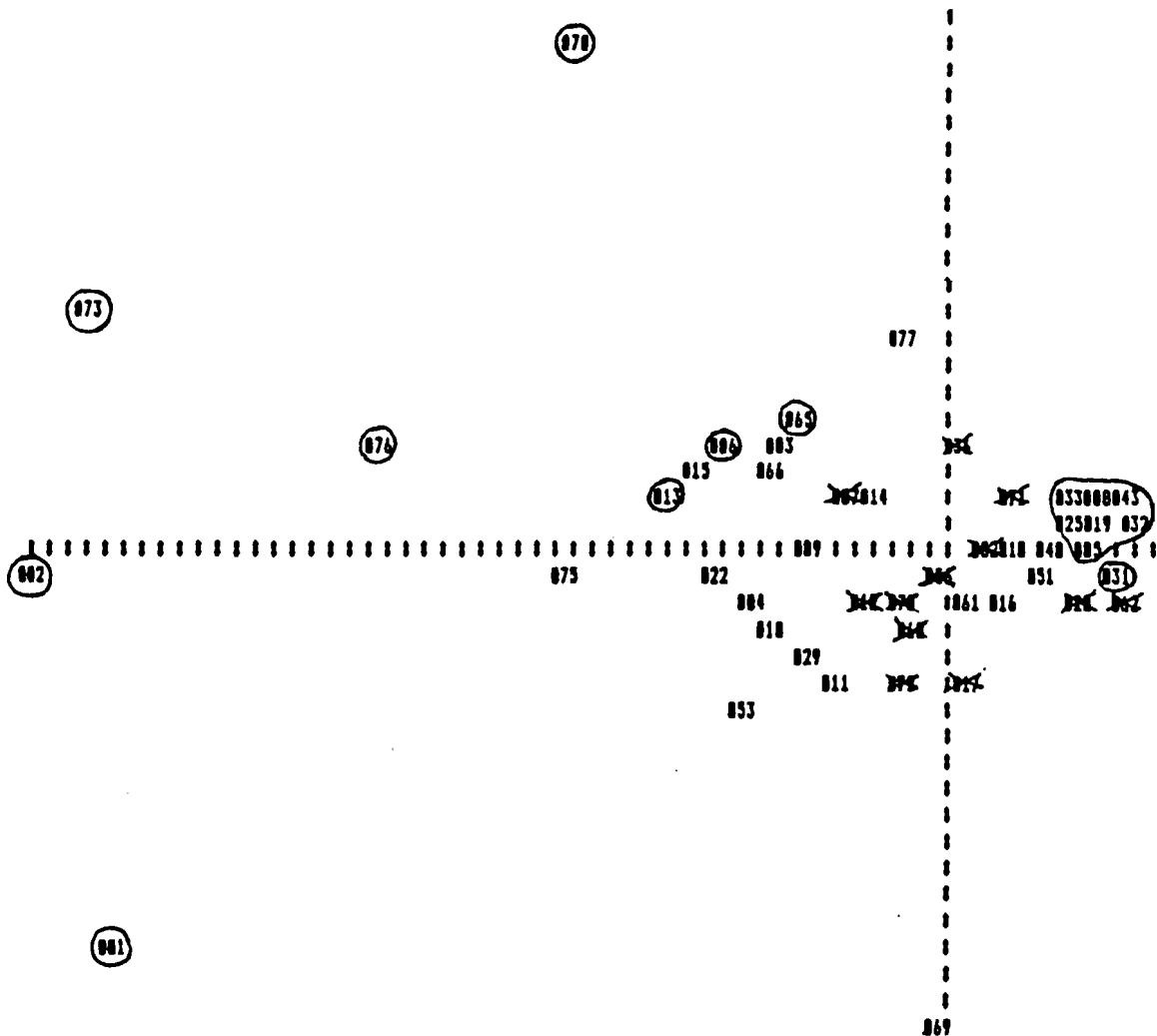


POINT WU : STR  
 POINT FH : TBO  
 POINT FH : POI  
 POINT CACHE : MAR  
 POINT CACHE : MOM  
 POINT CACHE : TOM

Correlation circle of the Principal Component Analysis of the Research in Chemistry in 17 French Tr in 1985 showing the similarity of search subjects.

Fig. 27

REPRESENTATION PLAN 1 2 AIE 1 HORIZONTAL U E 2 VERTICAL



POINT VU	011	EFFECTIF POINTS CACHES	: 3	LISTE	026, 037, 053,
POINT VU	044	EFFECTIF POINTS CACHES	: 1	LISTE	064,
POINT VU	016	EFFECTIF POINTS CACHES	: 1	LISTE	027,
POINT VU	010	EFFECTIF POINTS CACHES	: J	LISTE	073, 028, 033,
POINT VU	019	EFFECTIF POINTS CACHES	: 0	LISTE	021, 024, 030, 045, 059, 060, 074, 080,
POINT VU	025	EFFECTIF POINTS CACHES	: 1	LISTE	034,
POINT VU	031	EFFECTIF POINTS CACHES	: 1	LISTE	050,
min VU	032	EFFECTIF POINTS CACHES	: 11	LISTE	038, 040, 041, 042, 044, 046, 049, 053, 058, 064, 067,
POINT VU	033	EFFECTIF POINTS CACHES	: 1	LISTE	039,
POINT VU	013	EFFECTIF POINTS CACHES	: 1	LISTE	079,
POINT VU	051	EFFECTIF POINTS CACHES	: 1	LISTE	042,
POINT VU	054	EFFECTIF POINTS CACHES	: 1	LISTE	042,

Graph of the Principal Component Analysis of the Research in Chemistry in 17 French Trn in 1985 showing the more common subjects

**Annex: Chemical Abstracts Section Codes**

1	pharmacology
2	mammalian hormones
3	biochemical genetics
4	toxicology
5	agrochemical bioregulators
6	general biochemistry
7	enzymes
8	radiation biochemistry
9	biochemical methods
10	microbial biochemistry
11	plant biochemistry
12	nonmammalian biochemistry
13	mammalian biochemistry
14	mammalian pathological biochemistry
15	immunochemistry
16	fermentation and biochemical industrial chemistry
17	food and feed chemistry
18	animal nutrition
19	fertilizers; solids; and plant nutrition
20	history; education; and documentation
21	general organic chemistry
22	physical organic chemistry
23	aliphatic compounds
24	alicyclic compounds
25	benzene; its derivative; and condensed benzoid compounds
26	biomolecules and their synthetic analogs
27	heterocyclic compounds (one hetero atom)
28	heterocyclic compounds (more than one hetero atom)
29	organometallic and organometalloidal compounds
30	terpenes and terpenoids
31	alkaloids
32	steroids
33	carbohydrates
34	amino acids; peptides; and proteins
35	chemistry of synthetic high polymers
36	physical properties of synthetic high polymers
37	plastics manufacture and processing
38	plastics fabrication and uses
39	synthetic elastomers and natural rubber
40	textiles
41	dyes; organic pigments; fluorescent brighteners; and photographic sensitizers
42	coating; inks and related products
43	cellulose; lignin; paper; and other wood products
44	industrial carbohydrates
45	industrials organic chemicals; leathers; fats; and waxes
46	surface-active agents and detergents
47	apparatus and plant equipment
48	unit operations and processes
49	industrial inorganic chemicals
50	propellants and explosives
51	fossil fuels; derivatives; and related products
52	electrochemical; radiational; and terminal energy technology
53	mineralogical and geological chemistry
54	extractive metallurgy
55	ferrous metals and alloys
56	nonferrous metals and alloys
57	ceramics
58	cement; concrete; and related building materials
59	air pollution and industrial hygiene
60	waste treatment and disposal
61	water
62	essential oils and cosmetics
63	pharmaceuticals
64	pharmaceutical analysis
65	general physical chemistry
66	surface chemistry and colloids
67	catalysis; reaction kinetics; and inorganic reaction mechanisms
68	phase equilibria; chemical equilibria; and solutions
69	thermodynamics; thermochemistry; and thermal properties
70	nuclear phenomena
71	nuclear technology
72	electrochemistry
73	optical; electron; and mass spectroscopy and other related properties
74	radiation chemistry; photochemistry; and photographic and other reprographic processes
75	crystallography and liquid crystals
76	electric phenomena
77	magnetic phenomena
78	inorganic chemicals and reactions
79	inorganic analytical chemistry
80	organic analytical chemistry



Codes ELECTRIC de la base WPI/L

- 01 Measuring, testing. **Measuring**, dimensions, bearing R11
- 02 Measuring, testing. Indicating, recording, instruments R12
- 03 Measuring, testing. **Measuring volume**, height R13
- 04 Measuring, testing. **Measuring vibrations**, light, temp. R14
- 05 Measuring, testing. **Statics**, dynamics measurement R15
- 06 Measuring, testing. **Investigating chem./phys.props.** R16
- 07 Measuring, testing. **Measuring acceleration**, shock R17
- 08 Measuring, testing. **Meas. electric/mag.variables** R18
- 09 Measuring, testing. Radio, nuclear radiation; weather R19
- 10 Computing. Transferred to P81 R21
- 11 Computing. Transferred to P02 R22
- 12 Computing. Transferred to P83 R23
- 13 Computing. Transferred to P04 R24
- 14 Computing. Horology R25
- 15 Computing. Controlling, regulating R26
- 16 Computing. Digital **computers** R27
- 17 Computing. Analogue computers R28
- 18 Computing. Checking **devices** R29
- 19 **Display**, recording, Signalling R31
- 20 **Display**, recording. Transferred to P85 R32
- 21 **Display**, recording. Transferred to P86 R33
- 22 **Display**, recording. Education R32
- 23 **Display**, recording. **Musical instruments** R33
- 24 **Display**, recording. **Informatn. storage-** moving record R34
- 25 **Display**, recording. **Informatn. storage-** static stores R35
- 26 **Display**, recording. Instrument **details** R36
- 27 Basic electric elements, Conductors R41
- 28 Basic electric elements. **Magnets** R42
- 29 Basic electric elements, **Switches** R43
- 30 Basic electric **elements**. Relays R44
- 31 Basic electric elements. Discharge tubes R45
- 32 Basic electric elements, **Semiconductor devices** R46
- 33 Basic electric elements. Batteries R47
- 34 Basic electric elements. Aerials R48
- 35 Basic electric elements. **Emissive** R49
- 36 Electric power, communication. Electric power circuits R51
- 37 Electric power, communication. **Dynamoelectric** machines R52
- 38 Electric power, **communication**. Converters R53
- 39 Electric power, **communication**. Basic electric **circuitry** R54
- 40 Electric power, **communication**. Pulse technique R55
- 41 Electric power, communication. Transmission R56
- 42 **Electric** power, **communication**. Telecommunication R57
- 43 Electric power, communication, **Sorting** R58
- 44 Electric power, communication. Other electric techniques R59

Codes FARMAC de la base WPI/L

- 81 Farmdoc. Steroids - includes systems containing carboxylic or het. fused **B01**
- 82 **Farmdoc.** Fused ring heterocyclics **B02**
- 83 **Farmdoc.** Other heterocyclics **B03**
- 04 **Farmdoc.** Natural products and polymers, oligo, polypeptides **B04**
- 05 Farmdoc. Other organics, **aromatics**, aliphatics, organometallics **B05**
- 06 **Farmdoc.** Inorganics, including fluorides or toothpastes etc. **B06**
- 07 Farmdoc. **General - tablets** dispenser catheters, encapsulations, .. **B07**
- 08 Agdoc. Organophosphorus, organometallics **C01**
- 89 Agdoc. heterocyclic **C02**
- 10 Agdoc. Other Organic, Inorganic, General **comp.** veterinary but **not agro.** C03
- 11 Agdoc, **Fertilisers**, including **urea**, phosphoric acid, Excluding compost **C04**

Codes PLASDOC de la base WPI/L

- 01 Polysaccharides; natural rubber; other natural polymers A11
- 02 Of di- and higher olefins; acetylenics; nitroso cpds A12
- 03 Of aromatic mono-olefins A13
- 04 Of other subst. mono-olefins A14
- 05 Of unsubst. aliphatic mono-olefins A17
- 06 Addition polymers in general A18
- 07 Epoxides; aminoplasts; phenoplasts A21
- 08 Polyamides; polyesters A23
- 09 Polyurethanes; polyethers A25
- 10 Other condensation polymers A26
- 11 Condensation polymers in general A26
- 12 Preliminary processes A31
- 13 Polymer fabrication A32
- 14 Other processing and general A35
- 15 Monomers and condensants A41
- 16 Additives and compounding agents A60
- 17 Adhesives and binders A81
- 18 Coatings, impregnations, polishes A82
- 19 Clothing, footwear A83
- 20 Household and office fittings A84
- 21 Electrical applications A85
- 22 Fancy goods, games, sports, toys A86
- 23 Textile auxiliaries A87
- 24 Mechanical engineering and tools A88
- 25 Photographic, laboratory equipment, optical A89
- 26 Ion-exchange resins A91
- 27 Packaging and containers A92
- 28 Roads, Building, construction A93
- 29 Semi-finished materials A94
- 30 Transport A95
- 31 Veterinary, medical, dental A96
- 32 Miscellaneous goods A97
- 33 Threads and fibres - natural or artificial; spinning F01
- 34 Yarns - mechanical finishing of yarns or ropes; warping or beaming F02
- 35 Weaving - incl. finished products F03
- 36 Braiding, knitting - incl. trappings and non-woven fabrics F04
- 37 Sewing, embroidering, tufting - incl. finished products F05
- 38 Chemical type treatment of textiles F06
- 39 Other textile treatment - incl. clothing design, accessories, fasteners F07
- 40 Flexible sheet materials - incl. end products not class. in other sect. F08
- 41 Paper-making - product. of cellulose, chemical treatment of wood F09

Codes FOODDET de la base WPI/L

- 01 Food. Baking, bakery, flour, oven, transport, handling equip. pies, D11
- 02 Food. Butchery, meat treatment, processing poultry or fish D12
- 03 Food. Other foodstuffs and treatment, preservation, oil, butte., milk D13
- 04 Food. General foodstuffs machinery D14
- 05 Food. Treating water, waste water, sewage, scale prevention, sludges D15
- 06 Food. Fermentation industry, brewing, yeast, pharmaceuticals, alcohol D16
- 07 Food. Sugar starch excluding acidified polysaccharides D17
- 08 Food. Skins, hides, pelts, leather, fur, drying, wetting, cutting, D18
- 09 Disinf. Deter. Dental, toilet, toothpastes, cosmetics, shampoos D21
- 10 Disinf. Deter. Sterilising, bandages, sutures, plaster cas., prostheses D22
- 11 Disinf. Deter. Oils, fat, waxes, fatty acids, candles, essential oils D23
- 12 Disinf. Deter. Soap, including metal salts and fatty acids used for soaps D24
- 13 Disinf. Sert. Detergents - other soaps and used for cleaning D25

Codes SX-ELECT de la base WPI/L

- 01 Electrical instruments S01
- 02 Engineering instrumentation S02
- 03 Scientific instrumentation S03
- 04 Clocks and timers S04
- 05 Electromedical S05
- 06 Electrophotography S06
- 07 Digital computers T01
- 08 Analogue and hybrid computers T02
- 09 Data recording T03
- 10 Computer peripheral equipment TD4
- 11 Counting, checking, sorting Ta5
- 12 Process and machine control T06
- 13 Traffic control systems T07
- 14 Semicond. matls. and processes U11
- 15 Discrete devices U12
- 16 Integrated circuits U13
- 17 Memories and hybrid circuits U14
- 18 Logic circuits and coding U21
- 19 Pulse generation and manipulation U22
- 20 Oscillation and modulation U23
- 21 Amplification U24
- 22 Impedance networks and tuning U25
- 23 Resistors and capacitors V01
- 24 Inductors and transformers V02
- 25 Switches, relays V03
- 26 Printed circuits and connectors V04
- 27 Valves, discharge tubes and CRTs V05
- 28 Electromedical transducers V06
- 29 Fibre optics V07
- 30 Lasers and masers V08
- 31 Telephony and telegraphy W01
- 32 Broadcasting and transmission W02
- 33 Radio and TV receivers W03
- 34 Audio/visual rec. and reprod. W04
- 35 Signaling and alarms W05
- 36 Aviation and marine systems W06
- 37 Weapons/guidance systems W07
- 38 Power generation X12
- 39 Control equipment X13
- 40 Nuclear power generation Xi4
- 41 Solar, etc. power generation Xi5
- 42 Electric storage X16
- 43 Electric vehicles X17
- 44 Automotive electrics X22
- 45 Electric railways and signaling X23
- 46 Electric welding X24
- 47 Industrial electric equipment X25
- 48 Lighting X26
- 49 Domestic appliances X27

Codes MECHANIC de la base WPI/L

- 01 Vehicles in general. Wheels; tyres; connections Q11
- 02 Vehicles in general. Suspension; heating; doors; screens 012
- 03 Vehicles in general. Transmissions; controls Q13
- 04 Vehicles in general. Electric propulsion; seating Q14
- 05 Vehicles in general. Transporting special loads 015
- 06 Vehicles in general. Vehicle lighting, signalling Q16
- 07 Vehicles in general. Vehicle parts, fittings servicing Q17
- 08 Vehicles in general. Brake-control systems Q18
- 09 Vehicles in general. Air-cushion vehicles Q19
- 10 Special vehicles. Railways Q21
- 11 Special vehicles. Hand, motor vehicles Q22
- 12 Special vehicles. Cycles Q23
- 13 Special vehicles. Ships Q24
- 14 Special vehicles. Aircraft; aviation, cosmonautics Q25
- 15 Conveying, packaging, storing. Packaging; labelling Q31
- 16 Conveying, packaging, storing. Containers Q32
- 17 Conveying, packaging, storing. Closures Q33
- 18 Conveying, packaging, storing. Packaging elements, types Q34
- 19 Conveying, packaging, storing. Refuse collection; conveyors Q35
- 22 Conveying, packaging, storing. Handling thin materials Q36
- 21 Conveying, packaging, storing. Container traffic Q37
- 22 Conveying, packaging, storing. Hoisting; lifting; hauling Q38
- 23 Conveying, packaging, storing. Liqd. handling; saddlery, upholst. Q39
- 24 Building, construction. Road, rail, bridge construction Q41
- 25 Building, construction. Hydraulic engineering; sewerage Q42
- 26 Building, construction. Gen. building constructions Q43
- 27 Building, construction. Structural elements Q44
- 28 Building, construction. Roofing, stairs, floors Q45
- 29 Building, construction. Building aids; special structures Q46
- 30 Building, construction. Locks; window, door fittings Q47
- 31 Building, construction. Blinds; shutters; ladders Q48
- 32 Building, construction. Mining Q49
- 33 Engines, pumps. Machines, engines in general Q51
- 34 Engines, pumps. Combustion engines Q52
- 35 Engines, pumps. Jet engines Q53
- 36 Engines, pumps. Starting; ignition Q54
- 37 Engines, pumps. Machines, engines for liquids Q55
- 38 Engines, pumps. Pumps Q56
- 39 Engines, pumps. Fluid- pressure actuators Q57
- 40 Engineering elements. Securing machine parts together Q61
- 41 Engineering elements. Shafts; bearings Q52
- 42 Engineering elements. Couplings Q63
- 43 Engineering elements. Belts Q64
- 44 Engineering elements. Pistons Q65
- 45 Engineering elements. Valves Q66
- 46 Engineering elements. Pipes Q67
- 47 Engineering elements. Other engineering elements Q68
- 48 Engineering elements. Storing/distribution gas/liquid Q69
- 49 Lighting, heating. Lighting Q71
- 50 Lighting, heating. Steam generation Q72
- 51 Lighting, heating. Combustion Q73
- 52 Lighting, heating. Heating; ranges; ventilating Q74
- 53 Lighting, heating. Refrigeration Q75
- 54 Lighting, heating. Drying Q76
- 55 Lighting, heating. Furnaces Q77
- 56 Lighting, heating. Heat exchange in general Q78
- 57 Lighting, heating. Weapons Q79
- 58 Electroplating, electrolytic treatment, electro-deposition anodising M11
- 59 Chemical cleaning and degreasing, cleaning, pickling M12
- 60 Coating material with metal, diffusion, anamelling, cathodic sputtering M13
- 61 Other chemical surface treatments, etching, cathodic protection, inhibit. M14
- 62 Mechanical working of metal, rolling wire tube profile sheet forging M21
- 63 Casting, powder metallurgy, foundry, moulding, patterns, cores, casting M22
- 64 Soldering, welding, brazing, flame cutting, scarfing, unsoldering M23
- 65 Metallurgy of iron and steel, blast furnaces, converters M24
- 66 Production and refining of metals other than iron, control, testing M25
- 67 Non-ferrous alloys, includ. alloy production comp. M26
- 68 Ferrous alloys, production and composition M27
- 69 Electrolytic, electrothermic product. refining of non ferrous metals M28
- 70 Changing physical struct. of non-ferrous metals and alloys M29



Codes GENERAL de la base WPI/L

- 01 Agriculture, food, tobacco. Soil working; planting P11
- 02 Agriculture, food, tobacco. Harvesting P12
- 03 Agriculture, food, tobacco. Plant culture; dairy products P13
- 04 Agriculture, food, tobacco. Animal care P14
- 05 Agriculture, food, tobacco, Tobacco P15
- 06 Personal, domestic, Yearning apparei P21
- 07 Personal, domestic, Footwear P22
- 08 Personal, domestic. Haberdashery; jewellery P23
- 09 Personal, domestic. Hand, travelling articles P24
- 10 Personal, domestic. Office furniture P25
- 11 Personal, domestic. Chairs; sofas; beds P26
- 12 Personal, domestic. Chop; household; furnishing P27
- 13 Personal, domestic. Kitchen, sanitary equipment P28
- 14 Health, amusement. Diagnosis; surgery P31
- 15 Health, amusement, Dentistry; bandages P32
- 16 Health, amusement. Medical aids, oral admin P33
- 17 Health, amusement. Sterilising; syringes; electrotherapy P34
- 18 Health, amusement. Life-saving; fire-fighting P35
- 19 Health, amusement. Sports; games; toys P36
- 29 Separating, mixing. Crushing; centrifuging P41
- 21 Separating, mixing. Spraying; atomising P42
- 22 Separating, mixing. Sorting; cleaning P43
- 23 Shaping metal. Rolling, drawing, extruding P51
- 24 Shaping metal. Metal punching, working, forging P52
- 25 Shaping metal. Metal casting; powder metallurgy P53
- 26 Shaping metal. Metal milling, machining P54
- 27 Shaping metal. Caldering, welding metal P55
- 29 Shaping metal. Machine tools P56
- 29 Shaping non metal. Grinding, polishing P61
- 38 Shaping non metal. Hand tools, cutting P62
- 31 Shaping non metal. Working, preserving food P63
- 32 Shaping non metal. Working, cement, clay, stone P64
- 33 Pressing, printing. Presses P71
- 34 Pressing, printing, Working paper P72
- 35 Pressing, printing. Layered products P73
- 36 Pressing, printing. Printing; lining machines P74
- 37 Pressing, printing. Typewriters, stamps, duplicators P75
- 38 Pressing, printing, Books, special printed matter P76
- 39 Pressing, printing, Writing, drawing appliances P77
- 40 Pressing, printing. Decorative art P78
- 41 Optics, photography, general, Optics P81
- 42 Optics, photography, general. Photographic apparatus P82
- 43 Optics, photography, general. Photographs: processes P83
- 44 Optics, photography, general, Other photographic P84
- 45 Optics, photography, general, Education; cryptography; adverts P85
- 46 Optics, photography, general. Musical instruments; acoustics P86

Codes CHEMDOC de la base WPI/L

- 01 General organic. Containing E11
- 02 General organic. Organometallics E12
- 03 General organic. Heterocyclics E3
- 04 General organic. Aromatics E14
- 05 General organic. Alicyclics E15
- 06 General organic. Aliphatics E16
- 07 General organic. Other aliphatics E17
- 08 General organic. General hydrocarbon mixtures E18
- 09 General organic. Other organic compounds general E19
- 10 Dyestuffs, Azo E21
- 11 Dyestuffs, Anthracene E22
- 12 Dyestuffs. Heterocyclic E23
- 13 Dyestuffs. Other dyes, all precursors E24
- 14 General inorganic. Compounds of metals of groups Va E31
- 15 General inorganic. Compounds of metals of groups IV; E32
- 16 General inorganic. Compounds of metals of groups IIIa E33
- 17 General inorganic. Compounds of group Ia metals E34
- 18 General inorganic. Ammonia E35
- 19 General inorganic. Non-metallic elements E36
- 29 General inorganic. Mixtures of many components E37
- 21 Separation, evaporation, crystallisation, chromat., extract. J01
- 22 Mixing, crushing, spraying, dispersing, atomising (other than paint) J02
- 23 Electrochemical processes and electrophoresis (ozone, water, ..) J03
- 24 Chemical/Physical processes/ apparatus catalysis catalysts colloid-chem. J04
- 25 Boiling and boiling apparatus, steam generation unless power plant J05
- 26 Storing or distribution gas or liquids pipe; [excluding oil gas and HC] J06
- 27 Refrigeration, ice, gas liquefaction, solidification, separation J07
- 28 Heat transfer and drying, include steam condensers, exchangers J08
- 29 Furnaces, Kilns, ovens, retorts, furnaces J09
- 39 Fire Fighting, fire extinguishing, excld. fire engines, clothing K01
- 31 Protection against chemical warfare, fuses, blasting excld. missiles K02
- 32 Explosives, matches, incld. detonators, lighter, chem.lasers, smokes K04
- 33 Nuclear reactors and simulators. Exclud. power plants Ka5
- 34 Nuclear power plant - Incl. reprocessing of nuclear fuel K06
- 35 Health physic, incl. radiation protect. decontamination, wastes K07
- 36 Nucleonics, X-rays, neutrons, electrons beams, plasma welding K08
- 37 Glass, chemical comp. furnaces, flat-glass, bottles, containers L01
- 39 Refractories, ceramics, cements, soil roads, magnesia, abrasives L02
- 39 Electro-(in)organic, conductors, resistors, magnets, batteries, semicond. L03
- 40 Inorganic pigments - and non fibrous fillers 601
- 41 Inks, paints, polishes 602
- 42 Adhesives - excluding dispensers therefor 603
- 43 Miscellaneous compositions - incl. luminescent and tenebrescent mater. 604
- 44 Printing materials and processes 605
- 45 Photosensitive composition and bases; photographic processes 606
- 46 Photo-mechanical production of printing surfaces 607
- 47 Electrography, electrophotography and magnetography 608
- 48 Obtaining crude oil and natural gas - incl. explor., drilling, producing H01
- 49 Unit operations - incl. distill., sorption and solvent extraction H02
- 50 Transportation and storage - only large scale systems are included H03
- 51 Petroleum processing - incl. treating, cracking, reforming and catalysis H04
- 52 Refinery engineering H05
- 53 Gaseous and liquid fuels - incl. pollution control H06
- 54 Lubricants and lubrication - excl. self lubricating surfaces H07
- 55 Petroleum products, other than fuels and lubricants H08
- 56 Fuel product not of petroleum origin H09