

CHEMICAL CHARACTERIZATION OF ASPHALT HARDENING AND RELATION WITH THEIR RHEOLOGICAL PROPERTIES USING MULTIPARAMETRIC ANALYSIS.

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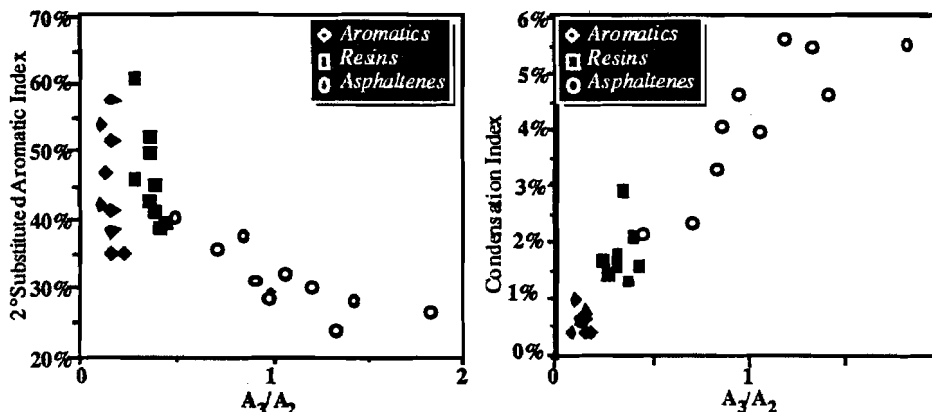
Asphalts can undergo oxidation phenomena during manufacturing processes and weathering. The knowledge of chemical alteration is required to understand the observed changes of rheological properties.

For this purpose, oxidation kinetics of asphalts and their CORBETT fractions have been carried out with an on line FTIR spectroscopy technique using a specific IR cell (based on the RTFOT, ASTM D2872-77). In addition, these original and oxidized asphalts have also been studied using Synchronous UV Fluorescence technique (SF).

Some aging indexes have been calculated from spectroscopic data, based on band areas of some functional and structural groups in FTIR and spectral ranges ratios of aromatic structures in SF. These indexes permit to anticipate the effects of oxidation according to the type of chemical structures present in asphalts.

In order to correlate these structural characteristics with rheological properties obtained by industrial tests, multiparametric analysis is a valuable tool. With this aim, four structural indexes have been selected, two ones as representative of aliphatic structures and two others as representative of aromatic structures. Functional parameters such as sulfur ratio, sulfoxide and carbonyl indexes are also included in this analysis.

These parameters are well correlated with some viscosity indexes which are characteristic of hardening processes. Then, according to these results, it could be possible to mix judiciously some crude oils in order to obtain suitable asphalts having the appropriate chemical characteristics to resist all oxidation phenomena.



Figures 1 and 2 . Correlations between FTIR and Fluorescence Indexes.