

ABSTRACT**Trinidad Lake Asphalt :
Towards The Elucidation Of The Chemical
Composition And How It Relates To Durability.****Clayton Sydney Smith**

Trinidad lake asphalt (TLA) as well as other related bituminous compounds were analyzed to determine their chemical composition, and how this composition affects durability.

New methods for the qualitative and quantitative separation of natural asphalt components were developed. These methods increased the efficiency of separation over standard methods, by effectively separating minerals and waxes from the bitumen and by obtaining sharper cut-off points between fractions. A novel secondary fractionation procedure was also developed which resulted in less complex fractions than the fractions obtained from the standard methods. This was an essential requirement before further analytical work could have been conducted.

KEYWORDS: TRINIDAD LAKE ASPHALT; CHEMICAL COMPOSITION; Compositional data for each of the materials is also reported. CHNOS analysis and functional group

monitoring gave some indication of the processes occurring upon air-blowing and accelerated weathering.

The natural asphalt was found to have a composition that more closely resembles blown rather than straight-run petroleum asphalts. The heteroatom content, degree of unsaturation and functional group composition were found to be related to asphalt durability.

The associations between components of the bitumen and the indigenous mineral matter of the natural asphalt were characterized. Asphalts with a high concentration of acidic functionalities, such as TLA, are predicted to show stronger interactions with clay minerals rather than silicates.

Knowledge of the colloidal chemistry of the materials was used to distinguish asphalt colloidal types via Korcak distribution. The results obtained by this method were similar to that obtained by viscosity measurements. The rheological properties of the natural asphalt was examined and modified through an understanding of the particle size distribution.

KEYWORDS: TRINIDAD LAKE ASPHALT; CHEMICAL COMPOSITION; DURABILITY; FRACTIONS; RHEOLOGICAL.