Comparative analysis between asphaltites and extra heavy oil asphaltenes

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Abstract. The asphaltite material receives many names depending on the country, or area of knowledge, for this reason it is also known as bitumen, asphalt and gilsonite, its composition is a mixture of high molecular weight organic substances, mainly polyaromatic compounds characterized by a black color, and they appear in a semi-solid or solid state. Asphaltenes correspond to the oil fraction with the highest molecular weight, this characteristic provides a high viscosity to hydrocarbons, which contain, in their composition, a concentration equal to or greater than 10%, although the exact structure of this is not known. molecular family, it has been possible to elucidate the functional groups present, such as carbonyl acids, thiols and pyridines, implying the presence of heteroatoms, such as nitrogen, sulfur and oxygen, but the most characteristic part of this type of molecules is their nucleus polyaromatic, which can contain up to 20 or more benzene rings. A sample of Colombian asphaltite was taken and compared with a sample of asphaltenes from a Colombian extra-heavy crude, solubility tests, a spectroscopic characterization by Ultraviolet-Visible, infrared, a thermal evaluation by Thermogravimetry and Differential Scanning Calorimetry were carried out. , in addition to an analysis by X-ray diffraction, in order to determine if the behavior and composition of both The objective of this investigation is to be analyzed by comparing a traditional asphaltite and an asphaltite, if the latter has the same properties and composition, with a view to being used as an energy source .The results obtained reveal that despite the fact that both substances present a similar composition, their glass transitions are different, as well as the crystalline phases present in each of the materials.

1. Introduction

The scarcity of conventional hydrocarbons, added to the high energy consumption of society, forces the search for new resources, which allow to preserve the current quality of life, one of the alternatives as energy of the future, are heavy crude oils, which have viscosities above 1,000,000 cP, thanks to the presence of a high molecular weight and high concentration asphaltenic fraction, another resource that can fill the void of conventional oil are asphaltites, natural solid materials with mainly organic.

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The expression "Asphaltene" originated in 1837 when Boussingault defined them as the Bitumen distillation residue: insoluble in alcohol and soluble in terpentine [1-3]. Currently, asphaltenes are