Extraction and characterization of Humic substances derived from Thailand’s leonardite
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Abstract: The major product of lignite mine in Lampang province, Thailand is lignite that use as source of energy for electricity and steam engine industry. Leonardite is a byproduct of lignite mine. It is natural oxidation product of lignite that associated with near surface mining. It was founded as a rich source of humic substance (HS). Humic substance consists of 3 fractions of humin (HU), humic acid (HA) and fulvic acid (FA) that can separate by different pH of base-acid treatment process. This research studied the effect of base type, concentration in base treatment process and effect of time during base-acid treatment process. The method consists of mixing of leonardite with base solution and stirring during condition time and base concentration. Then, the soluble was separated from insoluble fraction (humin) by centrifugation. The solution was adjusted to pH 2.0 by adding concentrate HCl. The precipitates formed at lower pH that conventionally known as humic acid (HA) was separated from solution by centrifuge. Humic substance was studied for morphology, chemical structure and element by SEM, FT-IR, UV-Vis and CHNO, respectively. Base type, concentration and reaction time have effect to solid yield and chemical structure. Solid yield and percentage of carbon of HA increase with increasing time and base concentration. Conversely, the oxidize molecule has decrease. This research provides relative of base treatment condition on humic substance extraction.

Keywords: Humic substance; Humic acid; Soil extraction; Leonardite