

## **Oxidation of Low Rank Colombian Coals with Hno3-Air**

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Abstract In this work humic acids were prepared from the oxidation of low rank coals from Montelíbano (Córdoba-Colombia). The samples were oxidized with air heated to 160, 180 and 200 °C and then oxidized with KMnO<sub>4</sub> and Na<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> solutions. The oxidized coal was characterized by means of proximate and ultimate analysis, infrared spectroscopy and thermogravimetric analysis. The ionic exchange capacity, the easily oxidable carbon (organic matter), total organic matter and carboxylic groups were determined. The humic acids obtained presented physicochemical properties that make them valuable for their use as fertilizers.

Keywords: Humic acids, air oxidation, aqueous oxidation, low rank coal.