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## 含油污泥组成及其对热解特性的影响

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### 中文摘要

对含油污泥及其主要组成矿物油与矿物质进行了成分分析, 并利用热重-红外光谱联用仪与管式电阻炉对比分析了含油污泥及其组成的热解过程与热解气体析出特性. 结果表明, ①含油污泥具有较高热值 (15 422.41 kJ/kg), 以石英为主要成分的矿物质在含油污泥中所占比重较大 (61.57%), 并与热转化性能较好的矿物油紧密结合; ②含油污泥热解过程依次经历干燥脱气 (50~180℃)、轻质油分挥发析出 (180~370℃)、重质油分热解析出 (370~500℃)、半焦炭化 (500~600℃) 与矿物质分解 (>600℃) 5个阶段; ③矿物质通过表面作用与导热性系数提升作用影响矿物油的热转化反应, 矿物油中的杂质元素会降低矿物质的分解温度; ④矿物质的存在降低了矿物油热解气体的产量并促进H<sub>2</sub>析出.

### 英文摘要

Based on property analysis of oil sludge and its main components (mineral oil and minerals), pyrolysis process and releasing behavior of non-condensed gas of oil sludge and its main components were studied by thermogravimetric analysis-fourier transform infrared spectroscopy (TG-FTIR) and tubular resistance furnace, respectively. The results indicated that, ① Oil sludge was characterized as relatively high heating value (15 422.41 kJ/kg), higher mineral content (61.57%) mainly composed of quartz. Mineral oil component had good thermal conversion property and adhered close with mineral in oil sludge. ② Pyrolysis process of oil sludge included 5 stages: water volatilization and gas desorption (50-180℃), light oil volatilization (180-370℃), heavy oil pyrolysis (370-500℃), semi-coke charring (500-600℃) and mineral decomposition (higher than 600℃). ③ Minerals influenced oil pyrolysis by surface function and enhancing heating conductivity, meanwhile minor elements in mineral oil could bring mineral decomposition temperature down. ④ Minerals affected the releasing behavior of non-condensed gas from mineral oil pyrolysis and resulted in lower total production and higher H<sub>2</sub> production.

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