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Microwave-assisted co-pyrolysis of pretreated lignin and soapstock for upgrading liquid oil: Effect of pretreatment parameters on pyrolysis behavior

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1 **Microwave-assisted co-pyrolysis of pretreated lignin and soapstock for**  
2 **upgrading liquid oil: Effect of pretreatment parameters on pyrolysis behavior**

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15

16 **Abstract**

17 The co-pyrolysis of pretreated lignin and soapstock was carried out to upgrade  
18 vapors under microwave irradiation. Results showed that the yield of 29.92-42.21 wt.%  
19 of upgraded liquid oil was achieved under varied pretreatment conditions. Char yield  
20 decreased from 32.44 wt.% for untreated control to 24.35 wt.% for the 150 °C  
21 pretreated samples. The increased temperature, irradiation time and acid concentration  
22 were conducive to decrease the relative contents of phenols and oxygenates in liquid

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