

## 两种树皮热解微晶结构及生物油组分对比

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### Comparative analysis of micro-crystal structures and bio-oils from pyrolysis of two barks

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**摘要** 以针叶材杉木树皮和阔叶材桉木树皮为原料,利用X射线衍射(XRD)对两种树皮热解前后固体颗粒微晶结构的变化进行了比较,利用气质联用(GC-MS)、凝胶渗透色谱(GPC)等手段对两种树皮生物油组分进行了对比分析。结果表明,两种树皮中的纤维结构及脂肪链结构在热解过程中发生了分解,基本被破坏。杉木树皮和桉木树皮生物油主要组分相似,含有酸类、酮类、酚类、醇类、醛类、糖类、酯类等物质,但相对含量存在差异;桉木树皮相对杉木树皮热解生成了较多的酸类、酮类物质,而酚类、醇类、糖类物质相对较少。两种树皮生物油中酚类物质占有较大的比例,以苯酚和邻苯二酚为主。两种树皮生物油主要物质分子量集中在300~500 g/mol,但桉木树皮生物油中分子量在300~500 g/mol的相对含量(48.18%)相比杉木树皮(61.14%)较少。

**关键词:** 杉木树皮 桉木树皮 生物油 组分分析

**Abstract:** Using softwood bark of Chinese fir and hardwood bark of eucalyptus as raw materials, the variation of their micro-crystal structures before and after pyrolysis was compared using X-ray diffraction. The components of bio-oils from 2 barks were analyzed contrastively with gas chromatograph-mass spectrometer and gel permeation chromatography. The results show that fiber structures and fatty chain structures in the bark are decomposed and destroyed. The main components of bio-oils, containing acids, ketones, phenols, alcohols, aldehydes, sugars and esters, are similar between the Chinese fir bark and eucalyptus bark, but the relative concentrations are different. On the contrary, the pyrolysis of eucalyptus bark produces more acids and ketones than Chinese fir bark, but phenols, alcohols and sugars are just the reverse. The phenols account for a large proportion of bio-oils, especially phenol and catechol. The molecular weight of bio-oils obtained from the bark is mainly concentrated from 300 to 500 g/mol; however, the relative concentration of eucalyptus bark (48.18%) is less than that of Chinese fir bark (61.14%).

**Key words:** Chinese fir bark eucalyptus bark bio-oil components analysis

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