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### 杉木油的提取及干馏油的精制

## Extraction of Chinese fir wood oil and refinement of pyroligneous oil

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中文摘要:

水蒸气蒸馏得到的杉木油品质优良,但得率低,为1.7%,干馏法粗杉木油得率高,为9.6%,但质量差,不能直接用于调香。为了提高杉木油得率和质量,该文以杉木根为原料,分别采用水蒸气法和干馏法制备杉木油,并对干馏油进行精制研究,重点研究过氧化物和脂肪醇存在下的自由基取代反应,及反应条件对干馏油香气改善效果的影响,得出较佳的工艺条件为:反应温度140℃,反应时间1h。采用GC-MS对提取的杉木油化学成分进行鉴定,其中水蒸气杉木油含有26种成分、杉木粗干馏油含有50种成分、干馏精油含有34种成分,它们的主要化学成分基本一致,都含有 $\alpha$ -柏木烯、 $\beta$ -柏木烯、柏木醇、罗汉柏烯等体现柏木油特征香气的化学成分。粗干馏油成分复杂,经过精制处理,除去了大量的羧酸类、酚类及 $\alpha,\beta$ -不饱和羰基化合物等影响干馏油香气质量的物质。干馏精油色浅、具有柔和的木香、膏香、树脂样的气息,基本能满足调香的要求,在香料工业中有广阔的应用前景。

英文摘要:

With the steam distillation method, high quality of Chinese fir oil could be obtained, but low yield of 1.7%. With the retorting method, yield of the crude pyroligneous oil was as high as 9.6%, but its quality was poor and the oil could not be directly used in the perfumery. In order to improve the quality and yield of Chinese fir oil, the Chinese fir oil was extracted from Chinese fir root by the steam distilling and retorting methods. The purification process of the crude pyroligneous oil was also studied, which focusing on the radical substitution reaction in the presence of the peroxide and the fatty alcohol and the influence of the reacting condition on the smell of the pyrolysis oil, and suitable technological conditions of reaction temperature and time (140℃ and 1h) were obtained. The chemical constituents and relative contents of the steam distillation oil, the crude pyroligneous oil and the refined pyroligneous essential oil were characterized by GC-MS with 26, 50 and 34 compounds respectively. Among all of the chemical constituents, the main components contained  $\alpha$ -Cedrene,  $\beta$ -Cedrene, Cedro, Thujopsene, etc., which were the characteristic aroma constituent for cedarwood oil. The composition among the crude pyroligneous oil was complex, and many carboxylic acids, phenols and  $\alpha,\beta$ -unsaturated carbonyl compounds which influenced the the pyroligneous oil aroma were removed by refining process. The result showed that the refined pyroligneous essential oil had light color, soft wood and tree fragrance, which may be used as a perfume raw material in the perfume industry.

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