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## Rapid Pyrolytic Gasification of Wood Loaded with Catalyst

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**Abstract:** Rapid pyrolysis of sugi (*Cryptomeria japonica*) and lauan (*Shorea* sp.) in an argon atmosphere was performed using a cylindrical reactor equipped with an infrared gold image furnace at 500-1000°C. The reactor was operated at a heating rate of 30°C/s, and the evolved gases were analyzed by gas chromatography. The yield of char was hardly affected by the pyrolysis temperature and was approximately 10 wt% for both sugi and lauan. The gross yields of H<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, and C<sub>2</sub>H<sub>6</sub> tended to increase as the pyrolysis temperature rose. At 1000°C, the proportion of H<sub>2</sub> in these low-molecular-weight gases was 28 mol% for sugi and 19 mol% for lauan. For enhancing the conversion into gases, zeolite, activated alumina, and kaolin were added to both woods as catalyst. As a result, production of both H<sub>2</sub> and CO were effectively increased for sugi with kaolin and lauan with activated alumina. The individual catalyst caused the amount of H<sub>2</sub> increase for sugi and lauan by factors of 1.7 and 3.2, respectively, at 1000°C.

**Keywords:** rapid pyrolytic gasification, wood, catalyst, hydrogen

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