

Abstract Submitted
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Conversion of Lignin to Valuable Compounds Induced by Discharge Plasma at Gas/Liquid Interface¹ SHIGENORI TAKAHASHI, Nagoya University, MASAMI BITO, J-Chemical, Inc., MASAHIRO TOKUDA, Sugiyama Chemical Industry Lab., WAHYU DIONO, NORIHARU TAKADA, HIDEKI KANDA, MOTONOBU GOTO, Nagoya University — This work focused on the pulsed discharge plasma as oxidation process of lignin obtained from wood. The pulsed discharge plasma is a low-cost process because the process is performed under normal conditions. The objective of this study is to convert lignin into value-added products induced by pulsed discharge plasma, such as vanillin. Lignin that used as a starting material was extracted from the wood powder of Japanese cedar by dissolving it in sodium hydroxide solution. Experiments were conducted using a batch type reactor and DC pulsed discharge plasma power supply unit. The DC pulsed voltages at 10 – 18 kV were introduced on the extracted lignin solution via the copper electrode under atmospheric pressure air or argon. The electrode was set at distance of 2 mm from the lignin solution surface. The products from the conversion of lignin in the aqueous solution were identified and quantified by HPLC. The results showed that the production of vanillin during discharge in air environment was larger than in argon environment due to expectedly abundant reactive oxygen species formation. However, the production of vanillin after discharge in argon environment was more rapid than in air environment following by the low molecular weight of lignin derived compounds.

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