

# Effective Dissolution of Biomass in Ionic Liquids by Irradiation of Non-thermal Atmospheric Pressure Plasma

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## Supplementary Materials

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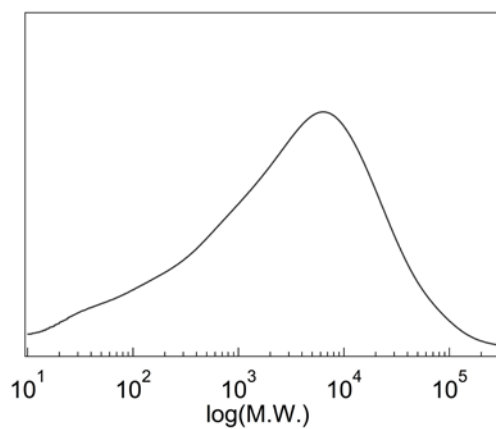
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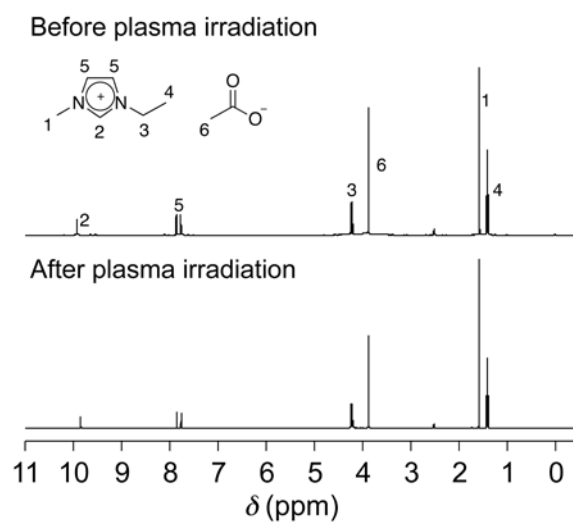
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Fig. S1 shows the molecular weight distribution of lignin after heating at 50 °C for 4h in an oil bath. There was no change of molecular weight distribution before and after heating. It supports that plasma irradiation decomposed the lignin structure.



**Fig. S1.** Molecular weight distribution of lignin after heating at 50 °C for 4h in an oil bath.

Fig. S2 shows that  $^1\text{H}$  NMR spectra of [Emim]OAc before and after plasma irradiation for 4h, and Table S1 shows the integral values of the peaks. There is no change in both spectra and the integral values after plasma irradiation for 4h. The results show that [Emim]OAc was not decomposed during plasma irradiation.



**Fig. S2.**  $^1\text{H}$  NMR spectra of [Emim]OAc before and after plasma irradiation for 4h.

**Table S1.** Integral values of the peaks of the protons in  $^1\text{H}$  NMR spectra of [Emim]OAc before and after plasma irradiation for 4h. The numbers of protons correspond to the numbers shown in Figure S2.

	Integral value					
	$H_1$ (3H)	$H_2$ (1H)	$H_3$ (2H)	$H_4$ (3H)	$H_5$ (2H)	$H_6$ (3H)
Before plasma irradiation	3.00	0.96	1.98	2.86	1.81	2.88
After plasma irradiation	3.00	0.96	2.01	2.92	1.79	2.95