

Effect of extractives in plasma modification of wood surfaces

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This paper presents data on wettability of freshly sanded black spruce (*Picea mariana*) wood surfaces after treatment in the flowing afterglow of nitrogen (N₂) and nitrogen–oxygen (N₂/O₂) dielectric barrier discharges at atmospheric pressure. Water contact angle measurements showed that plasma-treated wood samples became more hydrophobic and less hygroscopic, with the more prominent changes observed in nitrogen–oxygen plasma mixtures. Natural ageing experiments over a time period of 14 days indicated a change in plasma-treated wood surfaces to contact angles approaching those of untreated samples. On the other hand, when lower molecular mass molecules were removed from black spruce by various solvent extraction methods, plasma-induced modification seems much less pronounced. In addition, the latter samples were much more stable over time, indicating that wood extractives play a very critical role in such instability phenomenon.