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Analysis of Water Adsorption of Bamboos on the Basis of Hailwood & Horrobin Theory

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Abstract: Moisture adsorption properties of three typical bamboo species in Japan, namely madake (*Phyllostachys reticulate*), mousouchiku (*Phyllostachys pubescens*), and hachiku (*Phyllostachys nigra* MUNRO var. Henosis), were examined and analyzed on the basis of the Hailwood & Horrobin theory. The hygroscopicity of the three bamboos differ, and its ranking was madake<mousouchiku and hachiku, madake having been extracted with dilute alkaline solution. The hygroscopicity was greater in the inner than the outer portion of the cross section for all bamboo species. These differences were due to the extractives content in the bamboo substance, because they disappeared after extraction with 2% NaOH aqueous solution. It was presumed from the results of analysis based on Hailwood & Horrobin theory that the change in hygroscopicity following extraction with alkaline solution depended not only on the removal of extractives but also on the properties of regions newly created by the extraction which can swell with water adsoption.

Keywords: water adsorption, Japanese bamboo, Hailwood & Horrobin theory

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