原著論文

# 混合揮発性有機化合物（VOC）の吸着能に及ぼす木炭の炭化温度の影響

中島大介[1]，鈴木香織[2]，後藤純雄[1]，矢島博文[2]，石井忠浩[2]，吉澤秀治[3]，渡辺征夫[4]，酒井伸一[1]

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# The Effects of Carbonization Temperature on the Ability of Charcoal to Adsorb Mixed Volatile Organic Compounds

Daisuke NAKAJIMA[1], Kaori SUZUKI[2], Sumio GOTO[1], Hirofumi YAJIMA[2], Tadahiro ISHII[2], Syuji YOSHIZAWA[3], Ikuo WATANABE[4] and Shin-ichi SAKAI[1]

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## 要　旨

炭化物のVOC吸着性能の向上に関する基礎的検討として，1時間炭化して作成した木炭の室内における代表的な空気汚染物質である揮発性有機化合物（VOC）の吸着能に及ぼす炭化温度やVOC種類の影響を調べた。VOCの単一成分ガスまたは多成分混合ガスと炭化物をガラス製容器（3 L）に入れ，VOC濃度をGC/MSで測定しその経時変化から吸着能を調べた結果，炭化温度が400℃の場合にはほとんど吸着能を示さないが，600，800，1000℃と高くなると吸着能を示すようになることやVOCの種類によって単一成分ガス又は多成分混合ガスでは個々のVOCの吸着量が異なり，他のVOCの共存が吸着量に影響していることなどが示唆された。また，廃木材炭化物モデルとして合板（シナランバー）の炭化物を作製し，多成分混合ガスで試験を行った結果，同様の傾向となることを認めた。

## Abstract

This paper introduces a basic study on how to improve the volatile organic compound (VOC) adsorption performance of charcoals made from natural cypress wood and plywood. The study investigated the influence of carbonization temperature and the type of VOC on the adsorption capacity of charcoal for VOCs, typical indoor air pollutants. Single and multi-component mixtures of VOCs and charcoal were put into a 3L glass container. VOC concentrations were monitored by gas chromatography/mass spectrometry (GC/MS). VOC concentrations hardly decreased when charcoal carbonized at 400℃ was used. On the other hand, more VOCs were adsorbed as the carbonization temperatures of the charcoal were increased to 600℃, 800℃, and 1000℃. The adsorption amount differed for each type of VOC. It was noticed that the presence of other VOCs influenced the adsorption amount for single VOCs. Adsorption characteristics of plywood and natural wood charcoals were similar for the multi-component VOCs mixture.

**Key words:** mixed volatile organic compounds, charcoal, carbonization temperature