



## グローバル COE 物質科学イノベーション講演会

Utrecht 大学の Krijn P. de Jong 先生は、触媒のナノ構造を、電子顕微鏡 特に、3 次元のモルフォロジーのわかるトモグラフィー法により明らかにされてきました。今回、TOCAT6/APCAT5 に来日されますので、GCOE Summer School の特別講師をお願いしました。先生の最近の研究内容について、興味深いお話が伺えるものと思いますので、多数ご参加ください。

### 演 題 : " Carbon Nanofibers and Carbon Nanotubes for Catalysts and Sorbents "

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日 時 : 2010 年 7 月 18 日 ( 日 ) 8 : 45 ~ 10:15

場 所 : 定山溪萬世閣ホテルミリオーネ ( GCOE Summer School )

要 旨 : Nanostructured carbon materials such as carbon nanofibers (CNF) and carbon nanotubes (CNT) have attracted great attention in catalysis in recent years. In this talk we summarize some of our recent studies using CNF and CNT as support materials for catalysts and sorbents. Highly active and selective Co/CNF and Fe/CNF (preliminary results) catalysts for Fischer Tropsch synthesis have been obtained. For Co/CNF an optimal Co particle size of 6 nm has been found for activity, while promotion for enhanced selectivity was achieved by intimate contact of Co with MnO. Pt/CNF and PtSn/CNF showed high activity and selectivity for the hydrogenation of cinnamaldehyde to cinnamyl alcohol. Hydrotalcites (HT) supported on CNF are active solid base catalysts for reactions such as citral-acetone condensation and for MIBK production (using Pd-HT/CNF and acetone/H<sub>2</sub>). Moreover, HT/CNF displayed excellent sorption characteristics (uptake, durability) for CO<sub>2</sub> capture. Nitrogen-containing carbon nanotubes (N-CNT) have been obtained by control of the catalytic CVD conditions. The N-CNT has been used as solid base catalysts for the condensation of activated molecules. Hydrogen storage characteristics of light metal hydrides, in particular sodium alanate, have been largely improved by deposition onto CNF. Thus obtained 5-10 nm NaAlH<sub>4</sub> particles, for the first time, displayed desorption of H<sub>2</sub> at 85 °C which holds potential for use in combination with a PEM fuel cell. Ru particles inside and outside CNT have been characterized using electron tomography.

本講演は『化学研究先端講義 / 総合化学特別研究第二』の一部として認定されています。

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