

カーボンの中に金属が規則配列した触媒 ~CO₂削減や燃料電池の白金代替に期待~

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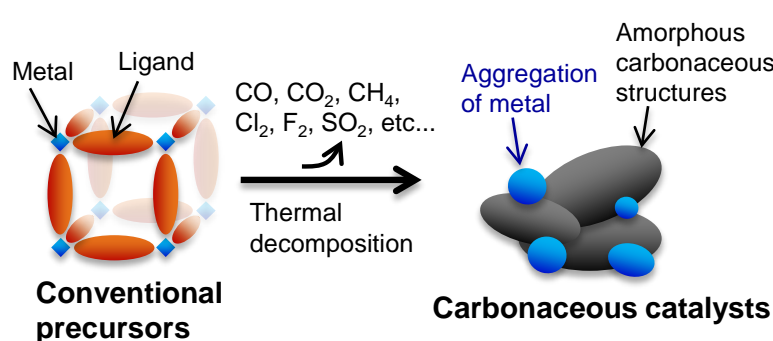
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Synthesis of ordered carbonaceous frameworks from organic crystals

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(a) Conventional carbonaceous catalysts



(b) This work

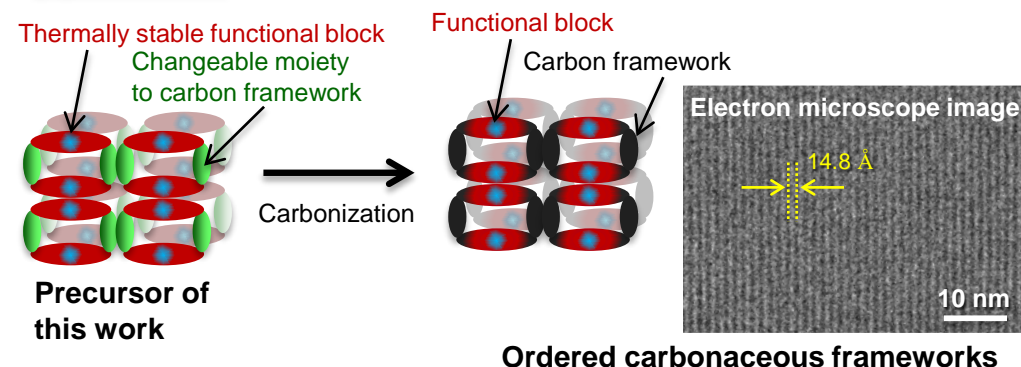


Figure1. Synthesis schemes of (a) conventional carbonaceous catalysts and (b) this work for ordered carbonaceous frameworks.

錯体結晶のように規則正しい骨格構造をもち、その中に金属原子が埋め込まれた新規炭素系触媒を合成する手法を開発しました (Fig. 1)。本手法により、触媒活性を発現する化学構造を持ちながら、炭素材料の利点である耐熱性、耐薬品性、導電性を兼ね備えた新材料の合成が可能となるため、CO₂転換触媒、燃料電池用の白金代替触媒をはじめとする様々な新規触媒の開発に繋がるものと期待されます。

While conventional carbonaceous catalysts have amorphous carbonaceous structures that cause a decline in catalytic activities (Fig. 1a), the proposing synthesis route enables the formation of carbonaceous catalysts with controlled chemical structures like organic-based catalysts (Fig. 1b). This synthesis route is capable of developing alternative catalysts of noble metals for many eco-friendly technologies such as fuel cell vehicles, hydrogen generation from water and CO₂ reduction.