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規則的な細孔を形成し、かつ黒鉛化されたナノウォール集合体を開発

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Ordered mesoporous structure by graphitized carbon nanowall assembly

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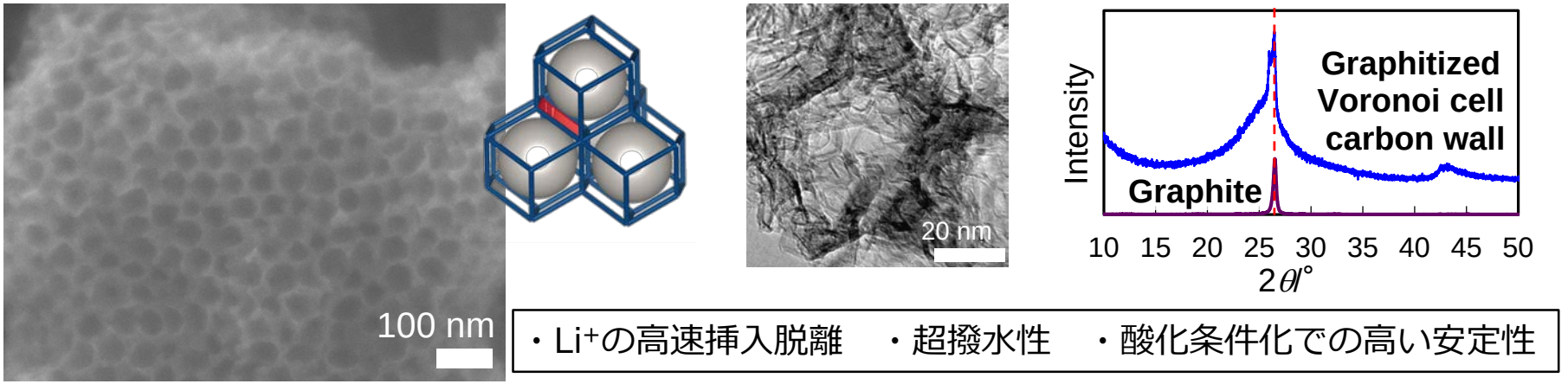

・Li^+の高速挿入脱離　・超撥水性　・酸化条件化での高い安定性

Figure (from left to right). Field emission scanning electron microscope, transmission electron microscope, and X-ray diffraction pattern of carbon nanowall assembly. Schematic diagram of regularly self-assembled polystyrene particles used as a template (neighboring 4 particles are shown here) and edges of rhombic dodecahedrons as the Voronoi cell are also shown. The cell walls are situated between the polystyrene particles, and one of them is shown in red.

理想的な面間隔の黒鉛微結晶を含むカーボンナノウォールが、細密充填されたナノ粒子鋳型のVoronoiセル構造となった集合体を開発しました。**3000 °C の黒鉛処理化を経たにもかかわらず炭素壁面からなる規則的な構造を有する初めての材料です。**このカーボンナノウォール集合体は通常の黒鉛と比較してリチウムイオンの電気化学的挿入脱離が速く、空気中の熱処理後にも超撥水性を示し、また、電気化学的参加条件化においても高い安定性を示しました。

Assembly of graphitized carbon nanowalls containing crystallites with the ideal interlayer distance was formed as a Voronoi cell structure of close-packed template nanoparticles. The assembly showed faster Li-ion intercalation and deintercalation than conventional graphite, a superhydrophobicity, which was retained even after thermal oxidation, and a high stability under electrochemical oxidative conditions.