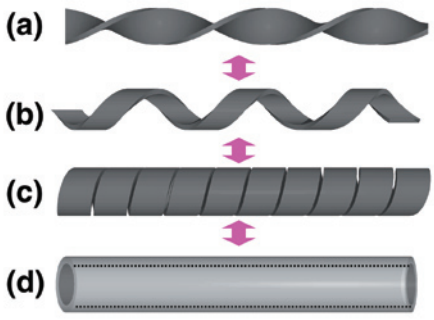
Precise Morphology Control of One-Dimensional Nanostructures

Mixed molecular species of cardanyl glucoside derived from renewable resources, which differ in the molecular structure of the hydrophobic chains, proved to produce nanotube structures upon self-assembly in water, while the pure saturated homologue generated a twisted fibrous morphology. In order to study their contribution to the nanotube formation, we fractionated the mixture into four individual components, *i.e.*, triene, diene, monoene, and saturated homologues. The rational control of self-assembled helical morphologies was achieved by binary self-assembling of the saturated and monoene derivatives. This method can generate a diversity of self-assembled high-axial-ratio nanostructures (HARNs), ranging from twisted ribbons to nanotube architectures.



Schematic representation of the typically obtained one-dimensional nanostructures

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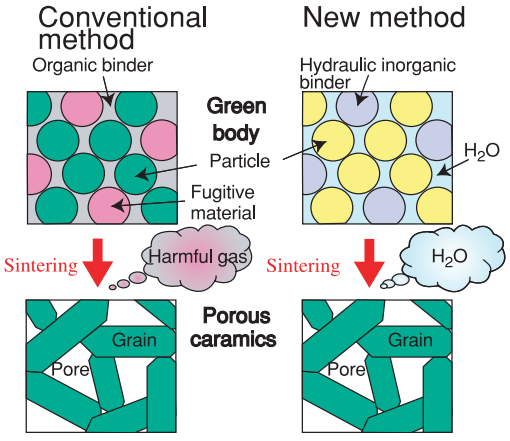
R & D of Eco-Friendly Ceramics Processing

A novel fabrication process for ceramics was developed using hydraulic inorganic binder and water. The hydraulic binder and water acted as agents for direct consolidation, and water acted as a fugitive material to create open pores too. The green bodies formed with the hydraulic inorganic binder and water had high compressive strength. The porosity of the sintered ceramics increased with the content of water in the starting mixture: porosities could be adjusted by the addition of water. The results of gas analysis measurements showed the emissions from the novel fabrication process of the porous ceramics to be environmentally safe.



Schematic of the novel fabrication process for ceramics

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