

Biogenic deposition of TiO_2 on the diatoms surface

백승필*, Bashistha Kumar KANTH, 여기백, 장의경,
유영하, 민기하, Shipra KUMARI, 기미란
고려대학교
(spack@korea.ac.kr*)

The cell wall of diatoms, unicellular photosynthetic eukaryotes, is silica structure with two dimensional pore arrays. Recently, it was suggested that nano-structured titanium dioxide can be metabolically incorporated into the surface of living diatoms (Biogenic TiO_2 particle). We obtained several species, *Navicula* sp. (#1271), *Nitzschia incospicua* (KMMCC-515), *Berkeleya fragilis* (KMMCC-1300) and *Calonies schroederi* (KMMCC-900) form Korean culture bank and testified which one is adequate for biogenic deposition of TiO_2 . We cultured each species in natural sea water supplemented with f/2 nutrients in the photo-bioreactor. A two-stage culture strategy was employed to incorporate titanium into each diatom silica frustule; In stage I, diatom cells grown up in dissolved silicon until silicon starvation. In stage II, soluble titanium and silicon were continuously fed to the silicon-starved cell. In the view of growth rate, *Navicula* sp. and *Calonies schroederi* seemed adequate. Analysis and comparison of SEM images of both species after SDS treatment showed that frustule of *Calonies schroederi* is stronger than that of *Navicula* sp.