Dissolution process of SiO2-TiO2 amorphous thin films derived by the sol-gel method

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In order to simulate the dissolution process in nature, the dissolution experiments of sol-gel derived SiO2-TiO2 amorphous films were performed. The film with a composition of SiO2:TiO2=5:1 in molar ratio (annealed at 90C in the air) was soaked in hot water at 100C for about an hour. It was revealed that SiO2 was leached out and anatase nanocrystallites were formed. On the other hand, anatase was not formed by the same treatment in the case of pure TiO2 amorphous film. It turned out that secondary minerals such as anatase can be formed with the dissolution of silica at a very low temperature and in a short time.