Comparative study of arsenite removal using ferrihydrite between adsorption/coprecipitation processes

KYAW SWAR OO[1], YUGO MITANI[1], CHIHARU TOKORO[*2]

[1] Graduate School of Creative Science and Engineering, Waseda University. 3-4-1 Okubo, Shinjuku-ku, Tokyo 169-8555, Japan (ksodom101@gmail.com , yu.mitani@toki.waseda.jp)

2 Faculty of Creative Science and Engineering, Waseda University, 3-4-1 Okubo, Shinjuku-ku, Tokyo 169-8555, Japan (correspondance: tokoro@waseda.jp)

This study discussed the removal mechanism of As(III) from simulated wastewater with Fe(III) in co-precipitation process. To investigate the removal mechanism in co-precipitation process, all experimental results were compared with simple adsorption process. Arsenic and ferric concentration in filtrate after experiments were analyzed by ICP and precipitates were characterized by XRD and XAFS analysis. It was revealed that a more efficient removal of As(III) was achieved with co-precipitation process than adsorption one. Resluts of XRD and XAFS analysis sugested that main mechanism of As(III) removal was surface complexation to ferrihydirte, however, mineralogical transformtaion of ferrihydrite was comfirmed only at high initial As/Fe molar ration in coprecipitation process.

Effect of coexistence of SO_4 for As(III) removal was also investigated. According to the results we can see that the coexistence of SO4 inhibited the As(III) removal and changed that removal mechnism of As(III) in coprecipitation process.

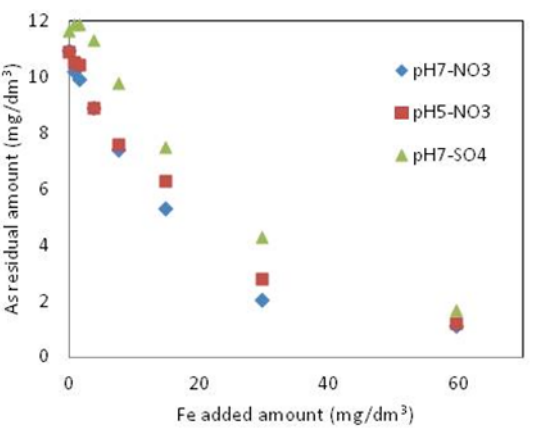

Fig. As(III) residual amount by co-precipitation process at pH5 and 7.