

## Simultaneous Removal of Cd and Pb Using in-situ Generated Nano-sized Sorbents

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A lab-scale system incorporating a high temperature furnace has been utilized to study the reaction of heavy metal species and sorbents. The interaction between heavy metal species (cadmium and lead) and sorbents with different injecting conditions is studied. Three different sorbents, a solid phase pillar intercalated clay (PICL) and two in-situ generated silica and titania, are used for capture of the heavy metals. The in-situ generated silica agglomerates had a high surface area and suppressed nucleation of cadmium and lead specie vapors at any injecting conditions. The mean particle size of heavy metals conjunction with silica is significantly larger than of heavy metals only feed. It can be tuned for effective capture in existing particle control devices. However, in-situ generated titania showed spherical form due to fast collision characteristic time and hindered to grow by heavy metal species. It showed smaller particle size distribution compared to silica except for injecting titania precursor into the first furnace and then injecting heavy metal specie into the second furnace. The PICL showed low removal efficiency of heavy metals because it had low concentration and unstable at high temperature.