

Biosorptive removal of lead by a new type of *Corynebacterium glutamicum* biomass

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The biomass of *Corynebacterium glutamicum* was tested for its ability to remove lead from the aqueous solution. *C. glutamicum* is the most generally utilized bacterium for production of lysine. The world market scale of lysine is up to 450,000 tons. However, it is a problem that a large amount of the fermentation by-product is generated from the lysine fermentation process. Biosorption isotherms were obtained in batch equilibrium experiments. The equilibrium isotherms indicated that the lead uptake increased with solution pH until pH 5 and the precipitation occurred at pH 6. Moreover, the calculation result by computer software, visual MINTEQ plus, showed that the precipitation of lead begins to occur at pH>5. The biomass has a low affinity for lead ions at a low concentration. On the other hand, the uptake capacity of lead was higher than biosorbents previously reported and other sorbents like activated carbon, zeolite, and synthetic ion exchange resin. Fourier transform infrared spectrometry studies were performed to find functional groups responsible for lead binding. In addition, the potentiometric titration was carried out to know quantities of these functional groups.