

## Equilibrium, Kinetic and Thermodynamic Studies of Simultaneous Co-Adsorptive Removal of Phenol and Cyanide Using Chitosan

**Authors :** Bhumica Agarwal, Priya Sengupta, Chandrajit Balomajumder

**Abstract :** The present study analyses the potential of acid treated chitosan for simultaneous co-adsorptive removal of phenol and cyanide from a binary waste water solution. The effects of parameters like pH, temperature, initial concentration, adsorbent dose, adsorbent size were studied. At an optimum pH of 8, temperature 30°C, initial phenol and cyanide concentration of 200 mg/L and 20 mg/L respectively, adsorbent dose of 30 g/L and size between 0.4-0.6 mm the maximum percentage removal of phenol and cyanide was found to be 60.97 % and 90.86 % respectively. Amongst the adsorption isotherms applied extended Freundlich best depicted the adsorption of both phenol and cyanide based on lowest MPD value. The kinetics depicted that chemisorption was the adsorption mechanism and intraparticle diffusion is not the only rate controlling step of the reaction. Thermodynamic studies revealed that phenol adsorption was exothermic and spontaneous whereas that of cyanide was an endothermic process.

**Keywords :** Chitosan, co-adsorption, cyanide, phenol.

**Conference Title :** ICEP 2014 : International Conference on Electronic Publications

**Conference Location :** journal city, WASET

**Conference Dates :** November 23-23, 2014