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Thermodynamic and kinetic studies of chlorophenol adsorption onto *Ricinus communis* pericarp activated carbon in aqueous solutions

Khalid Siraj
Jimma University, Ethiopia

This study reports the adsorption of 2-chlorophenol from aqueous solution and waste water using activated carbon prepared from pericarp of *Ricinus communis* by H2SO4 activation. The pericarp of *Ricinus communis* was carbonized and activated by treating with H2SO4 solution followed by heating in an oven at 105oC for 12 hrs. Batch adsorption experiments were also carried out as a function of pH, contact time, initial concentration of the adsorbate, adsorbent dosage and temperature of the solution. Kinetic studies of the data showed that the adsorption follows the pseudo-first-order kinetic model. Thermodynamic parameters, enthalpy changes (ΔH), entropy change (ΔS), and Gibbs free energy change (ΔG) were also calculated for the uptake of pericarp of *Ricinus communis*. This parameter showed that adsorption on the surface of *Ricinus communis* was feasible, spontaneous in nature, and exothermic between temperatures of 20 and 30oC. The equilibrium data better fitted the Freundlich isotherm model for studying the adsorption behavior of chlorophenol by pericarp of *Ricinus communis*. IR spectrum for loaded and unloaded pericarp of *Ricinus communis* was obtained using FT-IR spectrophotometer.

Biography

Khalid Siraj, Assistant Professor, Physical Chemistry, Jimma University, Ethiopia, received PhD in 2004 from Aligarh Muslim University (AMU), Aligarh, India. He conducted his research on solid ionic conductors. After receiving PhD he worked as Lecturer at SSITM (UPTU), Aligarh, India and thereafter joined Seventh April University, Libya. He is author and co-author of about 16 research articles in peer reviewed journals on various aspects of chemistry. His current research is focused on the removal of environmental pollutants using chemically activated carbon prepared from locally available adsorbents.

chemdocprof@gmail.com