

June 18-20, 2018 | Dublin, Ireland

J Ind Environ Chem 2018, Volume 2 | DOI: 10.4066/2591-7331-C1-003

## **DETERMINATION AND REMOVAL OF COPPER AND CADMIUM IN DRINKING WATER SAMPLES COLLECTED FROM JIMMA TOWN, SOUTH-WEST ETHIOPIA, USING ACTIVATED CARBON PREPARED FROM PUMPKIN SEEDS**

**Khalid Siraj**

Jimma University, Ethiopia

This study was designed for the determination and removal of heavy metal contaminants in drinking water samples collected from Jimma town, South Western Ethiopia using chemically activated carbon prepared from pumpkin (*Telfairia occidentalis*) seed. The activation was done by heating the mixture in an electrical furnace at 800°C for 3 hrs. Three types of drinking water samples (untreated, treated and distributed) had been collected from six different sites having a total of about twenty one samples. Two heavy metals, copper and cadmium had been studied and their concentration in some of the water samples was found to be (0.3 mg/L for Cu (II) and 0.0072 mg/L for Cd (II)) which was above the maximum permissible levels (MPL) compared to World Health Organization (WHO) limit that is 0.2 mg/L and 0.005 mg/L for copper and cadmium respectively. Adsorption experiments were carried out as a function of pH, contact time, initial Cu (II) and Cd (II) ion concentrations, adsorbent dosage and temperature of the solution for the removal of the ions. The equilibrium data better fitted to the Langmuir isotherm model for studying the adsorption behavior of the ions with correlation coefficient ( $R^2$ ) of  $> 0.999$ . Kinetic studies of the data showed that the adsorption follows the pseudo-second order kinetic model. Thermodynamic parameters  $\Delta G$ ,  $\Delta H$ , and  $\Delta S$  for the uptake of Cu (II) and Cd (II) ions were calculated suggesting that adsorption on the surface of activated carbon was non spontaneous and feasible; and endothermic between temperatures of 25°C and 45°C.