A PROCESS FOR REMOVAL OF ARSENIC, CHROMIUM, CYANIDE AND PESTICIDES FOR IMPROVING WATER QUALITY

Presence of arsenic (As) and chromium metal ions in drinking water has become the issue of global concern. Long-term exposure to even low concentrations of arsenic in the drinking water may cause skin, lung or prostrate cancer and cardiovascular, pulmonary, immunological and neurological disorder. A process has been developed for the removal of arsenic and chromium from contaminated water using nanoparticles of zinc peroxide (ZnO2) capped with glycerol/tri-ethylamine (TEA)/poly vinyl pyrrolidone (PVP). The synthesized ZnO2 nanoparticles remove arsenic and chromium from the contaminated water from the level of 25 ppm to less than the detection limits of the AAS-HG and FAAS/GFAAS instruments used respectively, which is less than the USEPA prescribed limit 10 ppb for arsenic and 50 ppb for chromium for drinking water.

The ZnO2 nanoparticles were synthesised by dissolving zinc acetate ammonia solution and the resulting solution was diluted with using suitable solvent. Hydrogen peroxide was also added in the prepared solution at room temperature. The solution was stirred on magnetic stirrer for 1 hour after adding hydrogen peroxide solution. The precipitate was centrifuged washed several times with 1:1 water-solvent mixture and then with de-ionized water several times. Finally the precipitate was dried at 105 deg. C. in an oven up to complete dryness.

COMPARATIVE ADVANTAGES:

Low cost
Highly effective
Environment friendly

Technology is ready to be licensed

