Available online at www.joac.info

ISSN: 2278-1862

Journal of Applicable Chemistry

2017, 6 (1): 94-99

(International Peer Reviewed Journal)

A Module Design–Arsenic Removal Filter for Rural Community

Kalpana kumari

Dept. of chemistry, B.P.S. College, Desari, B.R.A. Bihar University, Muzaffarpur, **INDIA**

Email: kalpna.chemistry@rediffmail.com

Accepted on 28th December 2016, Published online on 27th January 2017

ABSTRACT

The problem of arsenic intoxication by contaminated drinking water emerged in the past two decades, when surface water an ground water from open dug Wells and tube well formerly used to cover the drinking water supply in rural areas of many tropical regions. Chronic arsenic exposure can lead to severe health problems such as hyperkeratosis, melanosis, skin cancer and cancer of internal organs. Arsenic pollution of ground water has been recognised in the Ganga region of Bihar. The ground water of numerous households in this region is not only contaminated by arsenic but it also contains high iron concentration. Arsenic removal is necessary in urban and communal water as well as in areas pumping ground water through family based tube well. Therefore I have investigated the arsenic removal household filter for rural communities. The arsenic bio-sand filter (ABF) comprises of two removal unit- A) the arsenic removal unit consists of the metal diffuser box, citrus sinensis skin powder and a polyester cloth, B) the pathogen removal unit consists of sand and gravel layers. Arsenic removal is governed by the precipitation of iron hydroxides, which forms a coating on the sand's surface. Arsenic then adsorb to the iron hydroxide and forms complex compound with citrus sinensis skin which forms a coating on polyester cloth filter and also sand surface. The arsenic removal efficiency of (ABF) filters was examined from 10 samples collected from 10 sampling stations. Arsenics removal efficiency of 80% was achieved in ground water containing 10-21(ppb) and iron 0.75 to 3.50 mg L^{-1}. High iron concentration clearly enhances arsenic removal. ABF filters use locally available materials and are operated without chemicals can treat a reasonable amount of ground water within a short time and can easily replicate by the affected communities.

Keywords: Adsorption, ABF, Arsenicosis, removal.