

Development of Arsenic Filters



The three pitcher arsenic filtration system (known as 3-Kolshi) containing zero-valent iron as the active component was first developed in 1999. The filtration system was mass produced and used by many people. The instrument in the background, a computer controlled electrochemical analyzer for trace arsenic measurement was developed by the authors team (J. Environ. Sci. and Health, A35 (7), 1021-1041, 2000 and Talanta, 58(1), 33-43, 2002.



The three bucket system (known as Sono Filter) was developed in 2001 with composite iron matrix (CIM) as the active arsenic removal component. It retains all the excellent features of a 3-Kolshi system with stability and long life use. Both 3-Kolshi and bucket systems were extensively tested by the authors and by the Bangladesh Govt environmental technology verification programs and approved for home use. It was shown that CIM is the only system where arsenic removal efficiency increases with increased volume of groundwater filtered.



Thousands of these arsenic filters are in regular use. Shown here are the primary school children collecting arsenic free water. The filters are made of indigenous raw materials. It is estimated that more than a billion liters of clean water was filtered from 10000 such filters.



This arsenic filter is used in authors home (Kushtia, Bangladesh). These filters can produce 20 liters of clean water per hour for drinking and cooking. For about US \$35 they can last at least 5 years without a toxic waste disposal hazard. New models are developed for community scale use with flow rate exceeding 50 L per hour.