Comparison of pre-treatment options for arsenic reduction in household water systems

Pretreatment to convert As(3) to As(5)		
Method	**Advantages**	**Disadvantages**
Chlorination	Provides disinfection. Long history of effective use in public water systems.	Uses a hazardous chemical. Requires careful operation and maintenance. Chlorine may react with organic matter to form undesirable by-products. May cause a taste problem. Causes dissolved iron and manganese to precipitate, so filtration may be required.
Manganese dioxide filter	Requires no chemical use. Simple to operate.	Media can be expensive. Some vendors of household systems may not have expertise with the system.
Pretreatment to remove iron		
Method	**Advantages**	**Disadvantages**
Water softener (ion exchange)	Removes dissolved iron and manganese. Readily available; already used by many homeowners. Automated and simple to operate.	Not recommended for removing particulate iron or manganese. Produces salty brine that requires disposal.
Oxidation/filtration	Removes both dissolved and particulate iron and manganese. Removes some arsenic along with the iron.	Some systems require chlorine, which is a hazardous chemical. Produces waste water that requires disposal.