

SAFEDEF®

High Efficiency Fluoride Removal Media

Introduction

SAFEDEF® a new and very high efficiency Fluoride removal media. SAFEDEF® is rapidly becoming media of choice for removing fluoride from portable, community and filter for water supply schemes. This media can also be used for fluoride removal of fluoride containing waste water.



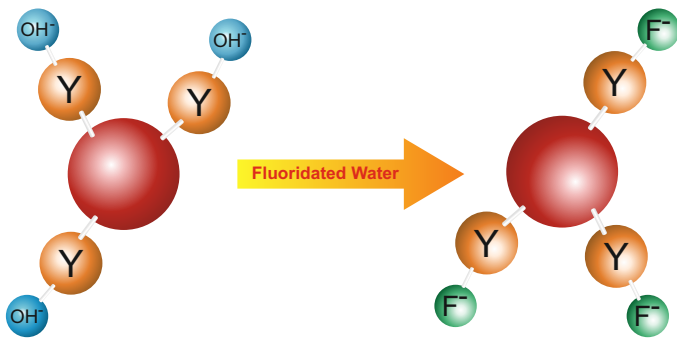
Identification of Material

Product Name	SAFEDEF®
Recommended use	Removal of Excess Fluoride from Water

Physical properties

Material origin	Natural mineral
Physical state	Solid grain
Color	White
Solubility	Insoluble in water
Bulk density	1.33 gram/ml
Particle size	0.5 mm to 1.0 mm

Fluoride removal mechanism & capacity



The principle of fluoride removal is based on the OH^- ion in the media being replaced by the fluoride. It is one of the most effective adsorbents of the fluoride with much faster reaction times than activated alumina and fluoride specific ion exchange media.

The fluoride removal capacity of SAFEDEF® is about 2~4 mg/g, which is superior than the most media under the same condition. The capacity is impacted by different raw water quality including fluoride concentration, temperature, co-existing ions etc.

Technical advantage

- High capacity and shorter contact time
- Does not release any harmful substances into the water that is to be treated.
- Safe to use, no dissolution of toxic and hazardous substances.
- High efficiency, SAFEDEF® can remove 99% fluoride of the raw water. Thereby the treated water could be mixed with the raw water in order to reduce the operating costs and extend the operation cycle.
- Steady capacity under other ionic competition like hardness etc.
- Lower regeneration cost and simple regeneration process



Performance comparison

Figure 1 and Figure 2 demonstrate that the SAFEDEF® media have higher performance than other common fluoride removal media under the same conditions. The treated water volume of SAFEDEF® is About 11.7 times of activated alumina and 23 times of activated clinoptilolite.

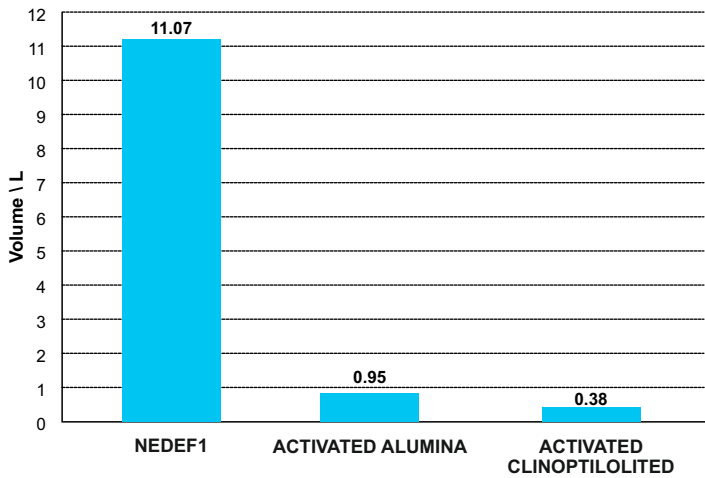


Figure 1. The volume of water treated by different media under the same conditions, the conc. of fluoride is 6mg/L in raw water

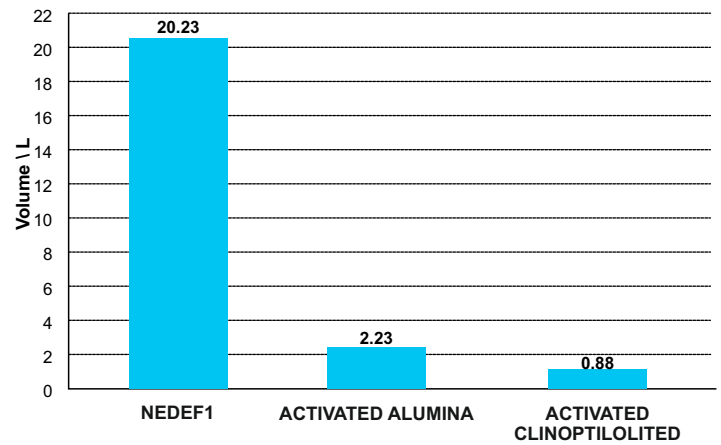
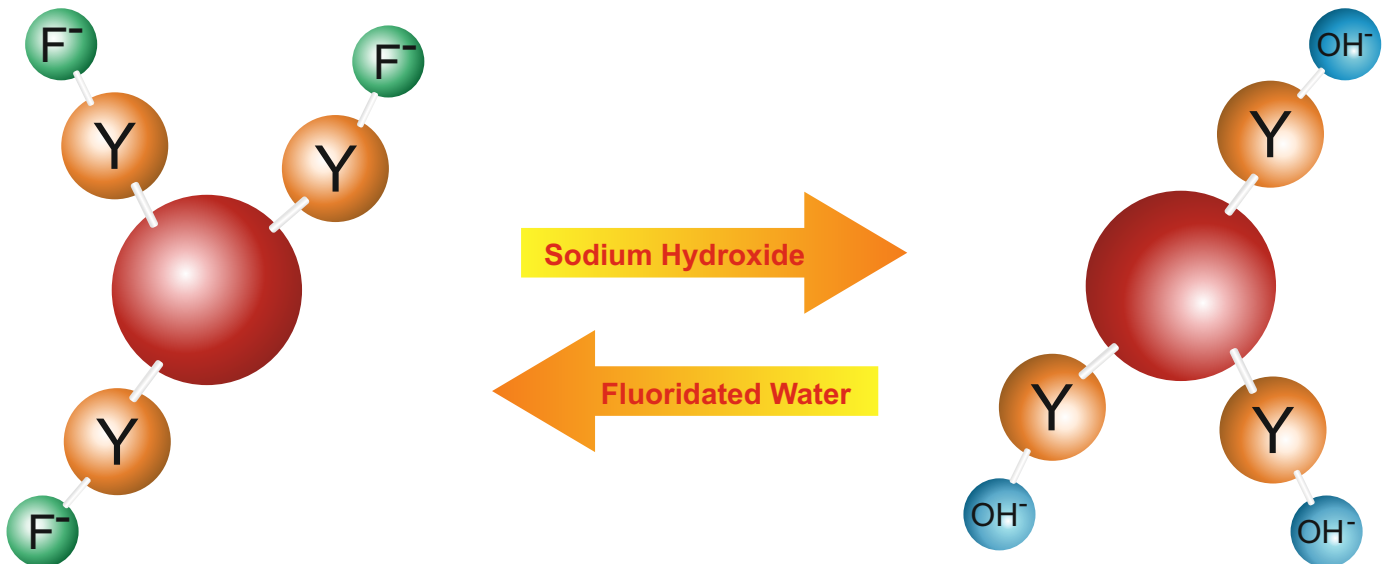


Figure 2. The volume of water treated by different media under the same conditions, the conc. of fluoride is 2mg/L in raw water

Regeneration:

Method	Concentration	Time
NaOH – recirculation	3 ~ 5%	1 ~ 2 Hrs
NaOH – Soaking	0.5 ~ 3%	6 ~ 8 Hrs



It's the reverse reaction of the fluoride removal mechanism. OH⁻ replaces F⁻ on the particle surface. Regeneration is carried out using 0.5 to 5 % caustic solution which is recirculated or soaked as per the above regeneration mechanism.