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The name "zeolite" will be very familiar to the Managers of Public Pools. At a time when every worthwhile bath house contained a public laundry, products with this name were used. In fact it was a misnomer - the materials were not zeolites and should not be confused with those materials available today.

Zeolites are a group of naturally occurring minerals and are widely spread about the face of the earth - often in megaton quantities. Zeolites possess several unique properties, but the one which is relevant to this article is the ability to ion-exchange. Their use in this way is nothing new - the Romans purified drinking water with them. …

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Now zeolite tuffs, which are natural products, are being offered as a replacement for sand in swimming pool filters. They arrive from different parts of the world under various trade names. The name "tuff" is used to describe their volcanic origin and means that they are composite materials with zeolites held in a "glue" of other minerals. The zeolite component obviously is responsible for the useful property of ion-exchange and the higher the zeolite content the more effective is the tuff.

The zeolite is clinoptilolite and this is the natural zeolite which has the most affinity to ammonium ions (there are some 35+ other natural zeolite minerals). The advantage of having the clinoptilolite present as a tuff, rather than separating out the pure zeolite, is that the tuff is a strong porous material which is ideal for filter bed use, rather than the use of pure zeolite which would be available as a fine powder. The tuff form also has the advantage of acting as a filter medium to remove dirt and colloids from pool water. It retains a greater volume of dirt than conventional sand, consequently the dirt is reduced. The increased capacity for dirt retention arises both from physical trapping of particles in the macropores of the tuff and the adhering of molecules to the surface of the zeolite. Zeolites have a much higher surface charge than sand and this is distributed over a high surface area (30m2 per gram of clinoptilolite).

It has been said that the efficiency of a zeolite as a filter medium is better than diatomaceous earth. With the use of a zeolite, it will be possible to extend the time between backwash. This will be of particular value to the managers of very heavily used pools who have to backwash daily.

The grade of zeolite selected for swimming pool use has other properties as well as being a superb filter medium. If the zeolite is pre-activated with sodium ions, it will absorb very large quantities of ammonia, in its various forms, and hold this ammonia in the filter for a considerable period of time. Not all the zeolites currently being offered have been so treated. In some commercial pools using pre-activated product, twelve to fifteen months have elapsed before the filter bed is saturated with ammoniacal products. At this time all that is necessary is to fill the filter shell with a 10% solution of common salt, and allow it to stand for about eight to ten hours. The filter should then be thoroughly backwashed, and the zeolite will then be as good as new, with its sodium content replenished.

Clinoptilolite offers another very important advantage. It reduces the usage of chemicals-especially chlorine. Much of the chlorine in a swimming pool is used to neutralise

ammoniacal by-products of pollution. Clinoptilolite will selectively take into its micropores ammonium ions. These are not be confused with the macropores between crystals in the tuff. These micropores are much smaller in diameter and run throughout the inside of the zeolite crystal. Their diameter is close to that of ammonium ion which, therefore, can be "sieved" out of solution. This property will work for other ammoniacal pollution products and also the chloramines formed between ammonium ions and chlorine (combined chlorine).

Since clinoptilolite will, of its own accord, remove ammonia products, some pools have found that chlorine usage has been reduced by as much as 50% (although the norm is probably a little less than this). Since the chlorine demand is lower, the need for ancillary chemicals is also reduced.. Less chlorine means less pH correction. Flocculating agents are not necessary, and are actually detrimental to the operation of the zeolite, since they block the pores in the clinoptilolite, and prevent them doing their work. As the amount of chemicals being introduced into the pool is considerably reduced, so will the build up of Total Dissolved Solids. Zeolites are at their most efficient with a pH of around 7.3 and this will lead to greater chlorine efficacy.

Zeolites are particularly beneficial in teaching pools, hydrotherapy pools and spas where the tendency to build up ammoniacal by-products is strongest.

Zeolites are aluminosilicates, and will wear out as does sand. The harder the zeolite, the longer the life of the product in the filter. Experience shows that zeolite has a working life about as long as that of sand. It will need replacing about every five to seven years.

In conclusion, the introduction of the correct grade of zeolite for filtration offers to the modern manager, a very efficient and cost effective alternative to traditional sand.