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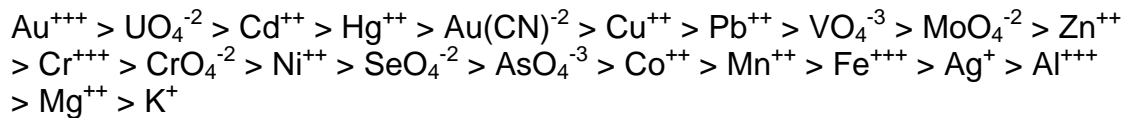
MetalZorb™

Treated Sponge Product for the Removal of Heavy Metal Contaminants

General Properties

Treated Sponge Products Type M and M-TU have selective affinity for heavy metals in cationic and anionic states in aqueous solution. MetalZorb functions by forming coordination complexes preferentially with ions of the transition group Heavy Metals, namely metals classified in groups IB through VIII B of the Periodic Table of Elements; and generally characterized as having incomplete inner rings of electrons or otherwise capable of existing in more than one valence state.

By comparison, metals such as calcium, magnesium and aluminum, having complete inner rings of electrons and single valence states, show poor affinity for the treated sponge. MetalZorb provides ligand sites that surround the metal and form a coordination complex. The order of its affinity for metals is influenced by solution parameters such as pH, temperature and total ionic content. However, the following affinity sequence of some representative ions can generally be expected to be:



When employed as a stationary bed in a tank or column through which an aqueous stream flows, absorption bands are produced generally in accordance with the affinity sequence. In certain situations, strongly absorbed species will displace less strongly absorbed species. This characteristic may be employed to separate ions. When utilized in an upward flow fluidized bed or in rotating drums, simultaneous absorption of a number of ionic species will occur in amounts relative to the initial concentration and affinity sequence.

At saturation, the MetalZorb will contain between 6% and 15% (dry weight) of absorbed ions, depending on the affinity of the sponge product for the ion and its molecular weight. This represents an absorption capacity of about 1.0 – 2.0 molar equivalent of absorbed ion/dry gram of sponge product. The presence of commonly abundant innocuous ions such as Na^+ , K^+ , Ca^{++} , Mg^{++} , Al^{+++} , Cl^- , SO_4^{-2} will not adversely affect the sponge's absorption capacity.

Applications

These treated sponge absorbents are highly effective for removing toxic species in low ppm and ppb concentrations from industrial wastewater, groundwater, stormwater, landfill leachate, municipal process streams and drainage waters. They are particularly useful in remediating waters that contain less than 20 ppm of targeted species, especially where treated effluent concentrations below 1 ppb are sought. Absorbent sponge is typically employed as a polishing operation following an upstream treatment such as a precipitation process. MetalZorb is uniquely capable of absorbing metals such as mercury, lead, nickel and cadmium, which are chelated by EDTA or other synthetic or naturally occurring chelating agents.

For applications where the solutions are high temperature or exposed to extreme pH ranges, please contact CleanWay for technical support.

Statement of Non-Warranty

All data, statements and recommendations in this publication are based on the best information available and believed to be reliable. CleanWay assumes no obligation or liability, and makes no express or implied warranty with regard to the data, statements and recommendation given or applications covered or results obtained. All information is given and accepted at the user's risk. Although no adverse physiological effects have been observed in the handling of the treated sponge product, users assume all risk of use and handling. No statement shall be taken as a recommendation of action or use without independent investigation. Users are reminded to practice such safety precautions as may be indicated in the particular circumstances to protect health and property.

Patents issued and pending.