

Arsenic & Activated Carbon

By Sarah Zrout

In 1986, California voters approved an initiative to address growing concerns about exposure to toxic chemicals. That initiative became the Safe Drinking Water and Toxic Enforcement Act of 1986, better known Proposition (Prop) 65. The act requires the state to publish a list of chemicals known to cause cancer, birth defects or other reproductive harm. This list, which must be updated at least once a year, has grown to include approximately 800 chemicals since it was first published in 1987.

Preemptive testing
can prevent costly
penalties in California

Aiming for Arsenic

In late 2008, the Center for Environmental Health (CEH) began to target activated carbon, which is alleged to leach arsenic. Inorganic arsenic compounds have been on the Prop 65 list since 1987, and inorganic arsenic oxides have been on the list since 1997. Arsenic is widely known to cause cancer and many other serious health problems.

Companies that manufactured, distributed, shipped or sold residential or commercial point-of-entry (POE) or point-of-use (POU) drinking water filtration systems utilizing activated carbon filters were initially investigated by CEH for allegedly discharging and releasing arsenic into drinking water sources in California. These companies settled, and since Oct. 15, 2009, no company is allowed to manufacture, distribute, ship or sell any products that leach arsenic in concentrations greater than 5 parts per billion (ppb) as determined by the test protocols in NSF/ANSI standards 42, 53 or the appropriate standard applicable to the product being tested. Since the original settlement, two more violations have been issued, with one judgment entered this past January.

If a company manufactures, distributes, ships or sells activated carbon to California residents, or plans to do so, it can save substantial penalty and testing expenses by having extraction testing performed on the activated carbon to analyze for arsenic. Ideally, companies should have passing data on hand in case lawyers contact them about arsenic levels in their activated carbon.

Testing Requirements

If manufacturers cannot show acceptable data and must settle with the state, they are required to have validation testing conducted on two products according to specific criteria each calendar quarter for one year. The first product is chosen based on void volume (which is the amount of water that fills the end product)-to-carbon-content ratio. Selection of the second product involves evaluating which has the most unit sales in the U.S. in each year prior to the required testing, and confirming that the product is still offered for sale in the U.S.

After a year of satisfactory compliance testing, the frequency of validation testing is reduced to once every six months. If validation testing demonstrates six years of continuous compliance with the 5-ppb reformulation standard, validation testing is no longer legally enforceable.

The last requirement for all settling defendants is to transmit initial flushing instructions for each product to its customers by means of installation manuals, owner's manuals, labels, packaging or other methods. POE products with bed volumes of 0.5 cu ft or less and all POU products must recommend initial flushing of no less than 10 bed volumes, and POE products with bed volumes of greater than 0.5 cu ft must recommend initial flushing of no less than 10 gal. In the best-case scenario—that all validation testing returns the required results—a company could still accrue fees for 30 tests that could have been prevented by preemptive extraction testing on the activated carbon.

All settling companies also are instructed to use activated carbon that follows and passes the protocol for raw material sampling and monitoring. This involves collection of a “thief” sample, taken at a specific time and location using a sampling tube, or special thief, either as a core sample or spot sample from a specific point in a container for every 5,000 lb of carbon in each lot (a discrete quantity of material).

The thief sample can be tested using one of three methods: column test, beaker test or beaker test for carbon used in block filters only. All water samples collected from any of the test methods need to be analyzed for arsenic in accordance with the U.S. Environmental Protection Agency methods referenced in NSF/ANSI Standard 53. The acceptable arsenic limit is 5 ppb. If any lot exceeds 5 ppb, the manufacturer is entitled to do further processing to reduce the levels of extractable arsenic. The lot is then assigned a new number and the additional processing must be recorded with documentation available upon request.

Penalty Prevention

It is recommended that cartridge manufacturers ensure their carbon suppliers are performing extraction testing with acceptable arsenic extraction limits. Documentation for all validation testing must be kept on record for five years.

Third-party testing is the best means to demonstrate compliance with Prop 65 requirements. The Water Quality Assn.'s (WQA) Gold Seal Program and Laboratory offers testing of granular activated carbon and activated carbon filters in accordance with the protocols described above. WQA also offers these companies listings on its website to demonstrate compliance. *wqp*

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