

Health and Safety

News

Regulations Change for Cobalt Indicating Silica Gel

Discussions on the Conservation Distribution List have alerted the conservation community to a change in European regulations regarding the use of cobalt impregnated indicating silica gel.

As of July 1, 2000, British Chemical Regulations have required indicating silica gel be labeled and disposed of as a hazardous material. This product is now classified as a potential carcinogen (by inhalation) due to the cobalt chloride moisture indicator and must be disposed of as hazardous waste. Cobalt is also a skin and respiratory system sensitizer. Cobalt is an EEC List II substance for control of dangerous substances in the aquatic environment and must not be allowed to contaminate soil and water. Gloves, lab coat and an effective dust mask (with a HEPA filter) should be worn, and safety glasses are currently recommended for work with cobalt impregnated indicating silica gels.

The cancer status varies on MSDS reports provided by manufacturers and suppliers from "no reports" to "Cobalt and its compounds have been shown to cause cancer in laboratory animals", even though cobalt chloride is not listed as either a known or anticipated NTP Carcinogen. According to the on-line MSDS from Mallinckrodt/Baker (revised 11/99) <<http://www.jtbaker.com/msds/c4928.htm>> inorganic cobalt compounds are an A3 animal carcinogen. The ACGIH TLV (threshold limit value) is 0.02 mg/M3. According to the GeeJay website (www.geejaychemicals.co.uk/cobaltchloride.htm), "Cobalt Chloride has been classified by IARC (International Agency for Research on Cancer) in Group 2B, "Possibly carcinogenic to humans." Cobalt chloride has not yet being listed on any US based hazardous materials registries, but its change in status abroad suggests that American conservators should treat this material with the same level of protection as is required elsewhere.

Cobalt is present in concentrations of

0.5 to 1.0% by weight in indicating silica gel. Concerns revolve around the contamination of silica gel dust with cobalt chloride (note that there are hazards stemming from the inhalation of silica dust)

If you must use silica gel with an indicator, there are several alternative products which contain an organic dye as an indicator. If you continue to work with indicating silica gel, please follow the safe handling procedures discussed on the GeeJay website and in their MSDS - wear a particulate respirator (with a HEPA filter) and gloves. In addition, wearing a lab coat and vacuuming the work area with a HEPA filtered vacuum after handling is recommended.

Disposal is still an issue in the United States because the status of cobalt salts has not yet changed here. However, small amounts can be processed as hazardous waste. For larger quantities, contact the manufacturer and ask them for a recommendation on disposal or reuse of the material.

Small RH indicating cards and test papers which turn from blue to pink also contain cobalt chloride. Chris Stavroudis spoke to a representative from Humidial about this issue and found out that they are in the process of rewriting their labeling to address the issue. In general, the use of these cards should not be a problem because the issue is potential inhalation of cobalt dust. However if the card gets wet (in a condensing environment, for example) there is the possibility that the cobalt chloride could migrate and recrystallize where it could conceivably become airborne.

There are also other indicator chemicals that perhaps conservators might consider as an alternative. For example, Sorbead Orange desiccant features a biodegradable, organic indicator (available from Engelhard Chemicals). The amount of indicator used in Sorbead Orange desiccant is five to 10 times lower than the amount of cobalt chloride found in cobalt chloride indicating desiccants. It changes from bright orange to translucent in color when it has adsorbed approximately 6% by weight of water. This desiccant can be regenerated (returned to its original orange color and adsorption capacity) by heating to a temperature of 270-320°F.

Another choice is available from Kaltron Pettibone: Silica Gel Yellow, an indicator gel with phenolphthalein (0.01% by weight concentration) which is distributed by Art Preservation Services. This indicator changes from yellow when dry to green, and finally to deep blue when the gel has adsorbed approximately 5% by weight of water. Heating temperatures for regeneration are the same as for most non-indicating gels, with a recommended range of approximately 300-350 F.

Information for this article was derived from an email by James Hales, Collections and Conservation Assistant at the Institute of Archaeology, London (email: tcrnjah@ucl.ac.uk) posted on the OSG-List. Another communication on this topic was posted by EMAIL on the ICOM-CC (Cecily Grzywacz). Dan Riss of the National Park Service has also made inquiries on this topic. Thanks also go to Chris Stavroudis who helped to gather some of this information in preparation for an article in the WAAC newsletter.

—Lisa Goldberg, Chair, Health and Safety Committee, [REDACTED], Corning, NY 14830;

Steven Weintraub, Art Preservation Services, [REDACTED], New York, NY 10128

Are Your Lungs Your Lab's Air Filter?

- Get a medical check-up
- Get fit tested with a respirator

*A healthy reminder from the
Health & Safety Committee*