From: WESTERSUND Joe
To: PALERMO Jaclyn
Cc: artglass2016
Subject: RE: art glass research questions
Date: Wednesday, August 17, 2016 3:37:27 PM
Attachments: vitrification technologies for treatment of haz and rad waste 1992.pdf

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Hi Jaclyn,

How's it going with the research list?

I've been gathering reference materials and have some info to help answer one of the questions- see below.

-Joe

Table 2-2. Inorganic Colorants for Glass (Tooley, 1984)

	Color Produced	
Material	Under Oxidation	Under Reduction
Cadmium Sulfide	None	Yellow
Cadmium Sulfide, Selenium	None	Ruby
Cobalt Oxide	Blue-violet	Blue-violet
Copper Oxide	Greenish blue	Greenish blue
Cuprous Oxide	Greenish blue	Ruby
Cerium Oxide	Titania Yellow	Yellow
Chromic Oxide	Yellowish green	Emerald green
Gold	Ruby	
Iron Oxide	Yellowish green	Bluish green
Manganese dioxide	Amethyst to purple	None
Neodymium oxide	Violet	Violet
Nickel oxide	Violet in K_2O glass	Violet in K_2O glass
Nickel oxide	Brown in Na_2O glass	Brown in Na_2O glass
Selenium	Fugitive	Pink
Sulfur	None	Yellow to amber
Uranium	Yellow with green fluorescence	Green with fluorescence

From: WESTERSUND Joe
Sent: Wednesday, August 10, 2016 11:29 AM
To: PALERMO Jaclyn <PALERMO.Jaclyn@deq.state.or.us>
Cc: artglass2016 <artglass2016@deq.state.or.us>
Subject: art glass research questions

Hi Jaclyn,

Here's a more organized list of questions where I think research is needed:

- What is metal HAP glass production level of Northstar, Trautman and Glass Alchemy?
  - Is it above or below the 5 tpy level discussed?
- Do CAGMs use mercury? (question posed by George)
- What are the biggest facilities (in terms of metal HAP glass production tpy) outside the Portland AQMA?
  - Current data is for total glass tpy, not comparable to rule threshold
  - This info would be useful for discussion about making statewide.
- What other metals are used by CAGMs, other than those regulated in the rule?
  - We discussed adding cobalt and selenium to the rule. Are there other metals used that are potentially toxic? Someone mentioned yrbium oxide, maybe there are some exotic ingredients that should also be in the metal HAP list.

-Joe

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