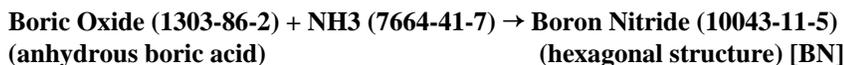


**TSCA Inventory Update Reporting**  
**Answers to Questions Submitted by GE**  
**November 8, 2004**

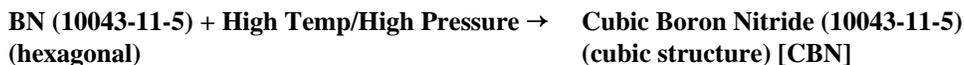
**1. I manufacture boron nitride according to the following equation:**



**Industry classifies boron nitride as a ceramic material. However, boron nitride is uniquely identified on the TSCA inventory. For the purposes of IUR, is boron nitride reportable under the ceramic category listing (66402-68-4) or as boron nitride (10043-11-5)?**

Since boron nitride is uniquely identified on the TSCA Inventory, it is subject to IUR reporting. You should evaluate the reporting requirements for Boron nitride [CASRN:10043-11-5] since your product would have to be identified as that particular substance. For the purposes of TSCA, a chemical substance having a definite chemical composition should be identified as such and should not be represented by the chemical category listing, "Ceramic materials and wares, chemicals", identified by CASRN 66402-68-4. Please note that "Ceramic materials and wares, chemicals" are considered mixtures which are not reportable under TSCA. However, the chemical substances formed in the manufacture of such ceramics are separately reportable. In the Note of 710.4(c)(2), it stated that "[A] chemical substance that is manufactured as part of a mixture is subject to these Inventory reporting regulations. This exclusion applies only to the mixture and not to the chemical substances of which the mixture is comprised. The term "mixture" includes alloys, inorganic glasses, ceramics, frits, and cements, including Portland cement."

**2. Are hexagonal BN and cubic BN (see equation below), which differ in the nature of their crystalline structures, considered to be identical for purposes of IUR? If so, is it then safe to assume that the atomic reconfiguration (in this example) does not constitute the "manufacture" of a BN compound under IURA, and therefore is NOT subject to reporting as a "manufactured ceramic"?**

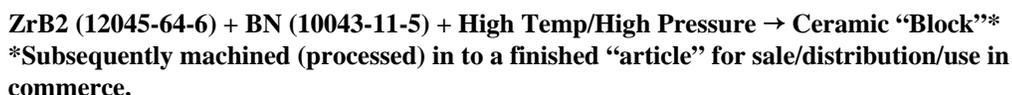


Under TSCA, a chemical substance is defined as having a particular chemical identity. Since the chemical composition has not changed, these substances have the same chemical identity as indicated by the same CAS number. The described processing does not result in another chemical substance and is not subject to IUR reporting requirements.

**3. I have a site that manufactures ten ceramic products, five of which are uniquely listed on the TSCA Inventory, and the other five represented by the ceramic category Inventory listing. What are my reporting obligations under IUR?**

You should evaluate each chemical substance uniquely listed on the TSCA Inventory to determine if the chemicals are subject to IUR regulations. For those that are reportable and meet the production volume threshold, submit completed copies of Form U. Concerning the other five ceramic products, you should determine if the production volume of each component (formed during the manufacture) of that ceramic mixture exceeds the reporting threshold. Complete and submit separate copies of Form U for each of the known component substances in the ceramic mixture listed on the Inventory that are reportable.

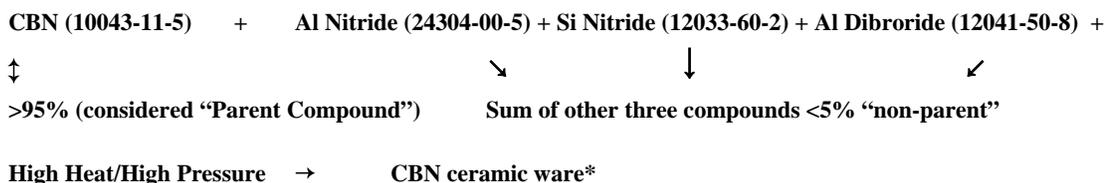
**4. I manufacture a ceramic block according to the equation below.**



**The manufactured material (the ceramic “block” in this example) has a well-defined stoichiometry specifically intended for it’s commercial end use – post machining. Industry considers this “block” to be an “engineered ceramic.” Assuming the “block” substance is not an article (because of the need to finish machine it for its intended commercial use), is it subject to IUR regulations? If so, how should it be reported?**

Assuming the chemical identity is fairly well-defined, the ceramic block cannot be identified as any of the categorical Inventory listings for statutory mixtures, and would be identifiable according to its specific chemical composition for reporting purposes. If the block is being cut and reshaped by cutting, it may be disqualified as an article and would then be reportable under the IUR by a specific chemical name that currently represents it on the TSCA Inventory.

**5. I manufacture ceramic wares according to the following equation:**



\*Specific industrial grade.

**In this example, where the non-parent compounds are added for physical characteristic/product performance reasons only, is the finished product (the**

**ceramic ware in this example) considered to be mixture of substances or part of the ceramic materials and wares category (66402-68-4)? Further, if one or more of these are added to the mixture in <1% concentration, does IURA recognize any de minimus levels?**

The manufacturer(s) who produced the four raw materials (cubic boron nitride (10043-11-5), aluminum nitride (24304-00-5), silicon nitride (12033-60-2), aluminum boride (12041-50-8)) should report for those substances. Furthermore, for reporting years after 2006, the manufacturer(s) should include information about downstream uses, assuming this information is readily-obtainable to the manufacturer.

In addition, the manufacturer of the “CBN ceramic ware” must also determine if this substance is subject to IUR regulations. EPA considers the “CBN ceramic ware” as one chemical substance and not a ceramic mixture if all the raw materials are reacted together.

The IUR does not recognize any de minimus levels; therefore, the concentration of the chemical in the product is irrelevant for determining the reporting requirements.

**6. I manufacture boralloy according to the following equation:**

**PBN (10043-11-5) + PG (7782-42-5) + High Temp/High Pressure → BE resistance heating ceramic (recrystallized BN) (recrystallized molded graphite) (Otherwise known as Boralloy\*)**

**BE = Borelectric  
\*Considered a “semi-metal.”**

**P = pyrolytic → occurs as result of deposition of carbon from a stream of methane on heated graphite – which causes crystals to form with thin parallel planes. This is otherwise stated as the Chemical Vapor Deposition process (CVD).**

**Is this product considered an alloy (“solid solution”), or part of the ceramic materials and wares category (66402-68-4)?**

This material would not be considered “Ceramic materials and wares, chemicals” [CASRN 66402-68-4], and probably would not be viewed as an alloy for IUR purposes. However, if there is no chemical reaction between PBN and PG, EPA would consider it as a mixture of boron nitride and graphite.

**7. I manufacture a coated graphite according to the following equation:**

**TaC<sub>2</sub> (12070-06-3), NbC<sub>2</sub> (12011-99-3), ZrC<sub>2</sub> (12070-14-3) → High performance coated graphite\* (7782-42-5)  
deposited on graphite substrate (metal carbide coatings)**

**\*Coating imparts a protection from corrosive environments (chemical or corrosivity resistance performance) – “functionalizing in reverse.”**

**Is this considered to meet the definition of “only alters a physical characteristic” as specified in the 1995 Inventory guidance document about Formulated and Statutory Mixtures Policy, or is this considered functionalized in the sense that it imparts a “lack of chemical reactivity,” where if it were not “functionalized,” the substrate would undesirably react? Do functionalized substances require different consideration under TSCA than simple mixtures?**

A product is made of a graphite powder with a surface treatment designed to make the graphite either hydrophobic or hydrophilic is considered to be a mixture under TSCA. The resulting hydrophobic or hydrophilic graphite is not reportable. Further film formation of a layer on the surface of graphite powder by deposition for protective coatings would be also viewed as a mixture of graphite and the substance comprising the layer. On the other hand, a substance which is made of a graphite powder with a surface treatment intended to impart chemical reactivity to the surface so that it can be further used as a chemical intermediate to react with another chemical substance would be a reportable chemical substance under TSCA.

The example states that the coating imparts protection from corrosive environments. If TaC<sub>2</sub>, NbC<sub>2</sub> and ZrC<sub>2</sub> are applied as a coating on graphite substrates as separate phases and seal the graphite surface to protect it from chemical or corrosive environments, the final coated graphite is considered a simple mixture of graphite and coating materials and is not reportable. The Agency considers such combinations comprising separate phases to be the same as a blend of two or more substances that has been physically combined without a chemical reaction. However, the manufacturer(s) who produced the TaC<sub>2</sub>, NbC<sub>2</sub>, ZrC<sub>2</sub>, and graphite are subject to IUR reporting and should determine whether they need to submit a Form U for each chemical substance independently.

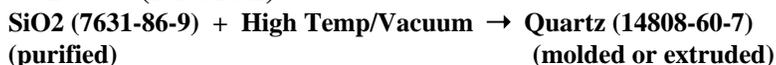
**8. My site manufactures 10 different types of glasses, all of which can be categorized by the 65997-17-3**

**TSCA Inventory Categorical Listing, our site uses 100 different raw materials to produce these glasses. Twenty of the 100 raw materials are listed on the TSCA Inventory and are also imported (my site is the “importer”). Is it necessary for my site to submit Form U for these 20 chemical substances? Does my site need to submit a Form U for manufacturing the glass (CAS# 65997-17-3)?**

**SiO<sub>2</sub> (7631-86-9) + Other Oxides (various CAS #s) + High Temp → Glass\* (65997-17-3)**

Yes, you need to consider all the chemical substances you import and determine if you meet the IUR reporting requirements for each substance. Glass is considered to be a mixture under TSCA and is not reportable. However, as a manufacturer of glass, you should evaluate the IUR reporting requirements for each chemical substance formed in the production of your inorganic glass, instead of reporting according to the glass category (CAS# 65997-17-3).

- 9. Quartz may be considered a type of glass. However, quartz is also individually listed on the TSCA Inventory. My site manufactures quartz using the reaction listed below. What chemical substances do I need to consider when evaluating my IUR reporting requirements: CAS# 14808-60-7 (for quartz), 65997-17-3 (for glass), or 7631-86-9 (for SiO2)?**



Your site would be considered to manufacture Quartz (CAS# 14808-60-7) from purified silica sand and therefore must consider the product as Quartz when evaluating your IUR reporting requirements. Since the chemical listing “Quartz”, which listed in the TSCA Inventory, is the most accurate description for your substance, it is subject to the IUR reporting requirements.

- 10. Alloy 123 (see table below) is imported in the form of a round disc, approximately 2-3" thick and 2-3' diameter. This disc would be further machined to form a moving part (meeting actual design spec) of an assembled final product. This final product is then sold as a subassembly for incorporation into a larger product. The form/shape of the imported disc is commonly referred to in industry parlance as “near-net-shape,” in that its overall shape and dimensions are largely preserved following the machining process. Does EPA consider Alloy 123 an “article” for IUR reporting purposes?**

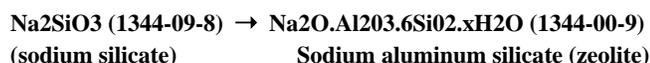
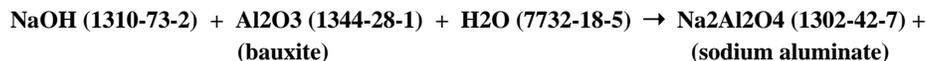
**Constituents of Alloy 123**

Component	% in Alloy 123
Nickel/Cobalt	52%
Iron	35%
Cadmium/Tantalum	5%
Molybdenum	3%
Chromium	2%
Titanium	0.9%
Copper	0.9%
Carbon	0.6%
Aluminum	0.4%
Silicon	0.2%

An article is an item manufactured in a specific shape or design for a particular end use application, and this shape is maintained as an essential feature in the finished product. In addition, there must be no beneficial change in chemical composition during end use of the article. In this instance, the disc is imported in near-net-shape which is maintained

in the moving part machined from the disc and the composition of the article does not change during machining or use except for non-beneficial corrosion. Accordingly, the disc comports with the definition of an article in 40 CFR 710.3 and the chemical substances comprising the disc need not be reported.

- 11. EPA specifically states in the 1995 Statutory Mixtures Policy that zeolites are mixtures and do not have to be individually reported. But components used to manufacture a zeolite may have to be reported. However, in the example below, a manufactured (synthetic) zeolite, has its own CAS # and TSCA Inventory Listing. As stated in the 1995 Mixtures Policy, hydrated forms are exempted, but anhydrous forms need to be specifically listed. In this example, is the anhydrous form of the zeolite, covered by CAS # 1344-00-9, required to be considered for IUR, or does the 1995 Statutory Mixtures Policy take precedent such that the zeolite as a whole entity does not have to be counted?**



Under the statutory mixture policy, the conventional zeolite, aluminosilicates, can be reported as a mixture of the constituent chemicals, in this case, sodium aluminate and sodium silicate, or else you could identify it as a substance, i.e., “sodium aluminum silicate”, however you identified that substance in commerce. Either the constituent chemicals Sodium aluminate and Sodium silicate or the Sodium aluminum silicate substance should comply with all IUR regulations.

- 12. Is the final activated or doped phosphor in the example below a “solid solution” as cited in the 1995 Statutory Mixtures Policy – thereby a mixture that requires only components that make up the mixture be subject to Inventory Listing, and as such, subject to IURA threshold determination and potential reporting?**

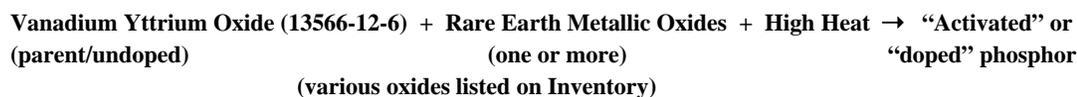
**If so, could the solid solution be simply the mixture of the “parent phosphor” (undoped) + the one or more dopants?**

- or -

**Is this a ceramic material – thereby a categorical mixture listed on Inventory (represented as CAS # 66402-68-4) – subject to likely aggregated reporting?**

- or -

**Is this a new chemical substance, subject to TSCA Section 5 (PMN, LVE, other applicable exemption), and therefore subject to IURA threshold and reporting on an individually doped phosphor by doped phosphor basis?**



Activated phosphors should be considered distinct chemical substances under TSCA. The basis for EPA's understanding on the need to report activated phosphor material is as follows: Activated phosphors are in general synthesized in a solid state reaction using precise quantities of the precursor chemical substances, both for the base materials and for the dopants that control the quality of light emitted. Exact amounts of precursors are used to maintain strict stoichiometry. Activated phosphor products have a different function from the undoped material that would be produced by the same synthetic process in the absence of dopant, and which would not emit light, which is the primary property sought. Because dopants provide the primary property sought from these materials, small or even trace amounts of dopant must be considered to be reactants which must be included in the chemical identity