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EBA comments to the ECHA consultation on the 6th priority list of substances for inclusion in Annex XIV: use of boric acid and disodium tetraborates in the manufacture of glass and frits

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The European Borates Association (EBA) represents the companies that manufacture or import 95% of the boric acid and 100% of the disodium tetraborates in the EU. The supply of these substances to the manufacturing of glass and frits collectively represents 62% of the total volumes manufactured or imported by the members of EBA in 2012. We would therefore like to make some additional supporting comments to qualify why boric acid and disodium tetraborates are intermediates in the manufacture of glass and frits. This position is in line with indications given by ECHA[1].

REACH defines an intermediate as a substance that is manufactured for and consumed in or used for chemical processing in order to be transformed into another substance (Article 3(15))[2].

The manufacture of glass and frits are two important uses of boric acid and disodium tetraborates. Glass and frits are substances in their own right[3]. The manufacture of a substance is not subject to the authorisation requirement[4]. During the manufacturing processes of glass and frits, boric acid and disodium tetraborates are completely transformed into a new substance, either glass (EC: 266-046-0) or frits (EC: 266-047-6). This is accomplished through a complex series of chemical reactions, which yield a new substance that is chemically and physically different from the starting raw materials[5]. Hence glass and frits manufacture are intermediate uses of borates.

In order for the manufacture of glass and frits to be considered an intermediate use, it is helpful to demonstrate that boron forms part of the structure of the substances that are glass and frits[2]. The EBA has undertaken its own activities in this area. It quickly became clear that there are many useful scientific articles in the literature on this subject, spanning several decades.

A review of the most relevant literature on the role of boron in the structure of glass and frits was published in June 2014 in Physics and Chemistry of Glasses: European Journal of Glass Science and Technology Part B[6]. This is a well-respected, peer-reviewed journal. The paper, "On the structural role of boron in borosilicate glasses", goes into great detail on the structural features of boron in borosilicate glasses (including frits) and describes the uses of such glasses and the beneficial properties that boron brings to these commercially important materials. The article shows beyond any doubt that boron forms an integral part of the structure of these two substances (glass and frits).

The main aim of using borates to manufacture glass and frits is to transform them into a new substance with a target overall chemical composition such that the substance has the right chemical and physical properties.

In the case of glass, the new substance that is glass may later be made into an article e.g. glass vessel, glass fibre, etc. But – it is essential to manufacture the new substance (glass) first, before forming it into an article. In practice the glass substance is not isolated as it is not energy efficient to cool the glass substance before re-melting it to form an article.

In the case of frits, they are placed on the market as substances.

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Conclusion

The use of boric acid and disodium tetraborates is an intermediate in the manufacture of glass and frits and should thus be excluded by ECHA in its assessment of uses in scope of potential Authorisation.

References:

1. Draft background document for Disodium tetraborate, anhydrous / Boric acid; Documents developed in the context of ECHA's sixth Recommendation for the inclusion of substances in Annex XIV, ECHA, September 2014.

2. Definition of intermediates as agreed by Commission, Member States and ECHA on 4 May 2010 (Outcome from the conclusive written procedure initiated on 20 April 2010 on document CA/04/2010rev.1 to the attention of the Competent Authorities for REACH and CLP.)

3. REACH Regulation 1907/2006/EC Annex V, section 11

4. CA/103/204 Q&A on the scope of certain authorization exempting provisions, 7 November 2014

5. "Misconceived ASTM Definition of Glass", Wright AC. Glass Technology: European Journal of Glass Science and Technology Part A, 50(2), April 2009

6. "On the structural role of boron in borosilicate glasses", Hubert M, Faber AJ. Physics and Chemistry of Glasses: European Journal of Glass Science and Technology Part B, 55(3) pp 136-158, June 2014

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