

Properties of boron and sources in drinking water

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6. Boron (CAS No. 7440-42-8) is a naturally occurring element in the earth's crust. Common borate compounds include boric acid, salts of boric acid (e.g., sodium tetraborates, which are also referred to as borax), and boron oxide. Boron originates from both natural sources and anthropogenic sources (Coughlin, 1996). Natural processes like weathering contribute more significantly to environmental boron levels compared to anthropogenic activities (US EPA, 2008). Human exposure to boron through drinking water occurs primarily in areas with boron-rich aquifers or where borates are released from industrial or agricultural sources (WHO, 2009). In both water and soil, its fate is largely governed by pH, which determines whether boron exists primarily as undissociated boric acid (dominant at acidic pH) or as borate ions (dominant at alkaline pH above the pKa of 9.2) (WHO, 2009; Health Canada, 2023). The chemical and toxicological properties of boric acid and other borates are considered similar on a molar boron

equivalent basis when dissolved in water or biological fluids (WHO, 2009). For further information on the properties of boron, see [TOX/2025/31](#).