

深層海水之硼含量探討

Boron in Deep Ocean Water

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摘 要

深層海水 (Deep Ocean Water, DOW) 泛指海平面 200 公尺以下的深層海水，其藉著高度純淨性、無限再生性、低溫安定性以及含量豐富的營養鹽與礦物質，被視為極具發展潛力的水資源，坐擁「藍金」之美名。然而，隨著深層海水的擴展與普及，其對於人體的影響亦成為各界關心的主題；例如深層海水中的硼含量議題。深層海水的硼含量通常在 4~5ppm 之範圍，該濃度遠超過許多國家的一般飲用水規範；此外，深層海水的硼含量並無法藉由以往的海水淡化方式 (例如：逆滲透) 來有效的降低濃度，致使高濃度硼含量的海洋深層水有危害人體之疑慮。由此，如何有效降低深層海水中的硼含量，勢必是發展深層海水的關鍵。以下將以硼的潛在性危害、各國水質標準以及深層海水之硼含量為主軸，闡述三者的密切關係。

關鍵詞：深層海水、硼、硼酸、飲用水、飲用水水質標準。

Abstract

Deep ocean water (DOW) is the ocean water under 200 meters where isolated from sunlight. Unlike surface seawater, deep ocean water has low-temperature stability, inorganic nutrient richness, and purity. Although those characters make deep ocean water have great potential for new applications in water resource, there still have some potential risk to human body by using the deep ocean water for drinking water (e.g., boron). In recent years, owing to the rising awareness of human health, more and more country establish health-based guideline value for boron (B) in drinking water. For deep ocean water, the boron concentration is about 4 ~ 5 ppm, it is far exceeds the requirement for boron concentration in human body, which is below 0.5 ~ 1 ppm. Furthermore, it is hard to achieve such low boron concentration in deep ocean water by using traditional technique reverse osmosis because of boron with small atom. As mentioned above, how to make boron removal more effective is a key issue in deep ocean drinking water. In this paper, we will discuss the relationship between the deep ocean water, boron concentration and drinking water quality.

Key words: Deep ocean water (DOW), Boron, Boric acid, Drinking water, Drinking water quality.

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