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Mwakabona, Hezron T

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Metallic iron for safe drinking water provision: Considering a lost knowledge

Hezron T. Mwakabona, Arnaud Igor Ndé-Tchoupé, Karoli N. Njau, Chicgoua Noubactep, Kerstin D. Wydra

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Abstract

Around year 1890, the technology of using metallic iron (Fe⁰) for safe drinking water provision was already established in Europe. The science and technology to manufacture suitable Fe⁰ materials were known and further developed in this period. Scientists had then developed skills to (i) explore the suitability of individual Fe⁰ materials (e.g. iron filling, sponge iron) for selected applications, and (ii) establish treatment processes for households and water treatment plants. The recent (1990) discovery of Fe⁰ as reactive agent for environmental remediation and water treatment has not yet considered this ancient knowledge. In the present work, some key aspects of the ancient knowledge are presented together with some contemporised interpretations, in an attempt to demonstrate the scientific truth contained therein. It appears that the ancient knowledge is an independent validation of the scientific concept that in water treatment (Fe⁰/H₂O system) Fe⁰ materials are generators of contaminant collectors.

Keywords

Knowledge loss; Reactive filtration; Revolving purifier; Water treatment; Zero-valent iron