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Influence of physicochemical properties of various soil types on iodide and iodate sorption

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1 Influence of physicochemical properties of various soil types on iodide and iodate sorption

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12 Abstract

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14 Studies that deal with iodine mobility in uncontaminated agricultural soils are scarce and
15 unique. Therefore, in this article, we have evaluated the sorption behavior of two most
16 abundant naturally occurring inorganic iodine species – iodide and iodate – in several soil
17 types. Our results showed that the sorption process is extremely slow with equilibrium
18 achieved after ten days. The sorption of both iodine species is well described by Freundlich
19 isotherm. The affinity of iodine for all investigated soils in the observed concentration range
20 is relatively low. Our results showed that besides iodine speciation, sorption efficiency is
21 highly dependent on soil types and their characteristics. While in mineral soils with low
22 organic carbon content iodide sorption is dominant, organic rich soils are more favorable for
23 iodate sorption. Organic carbon, clay content, pH and the abundance of iron, aluminum and
24 manganese oxides and hydroxides showed to be the most important soil properties controlling
25 iodine sorption. Our results provide new insight into the complex iodine behavior and

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