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Oxidation mechanisms and chemical bioavailability of chromium in agricultural soil – pH as the master variable

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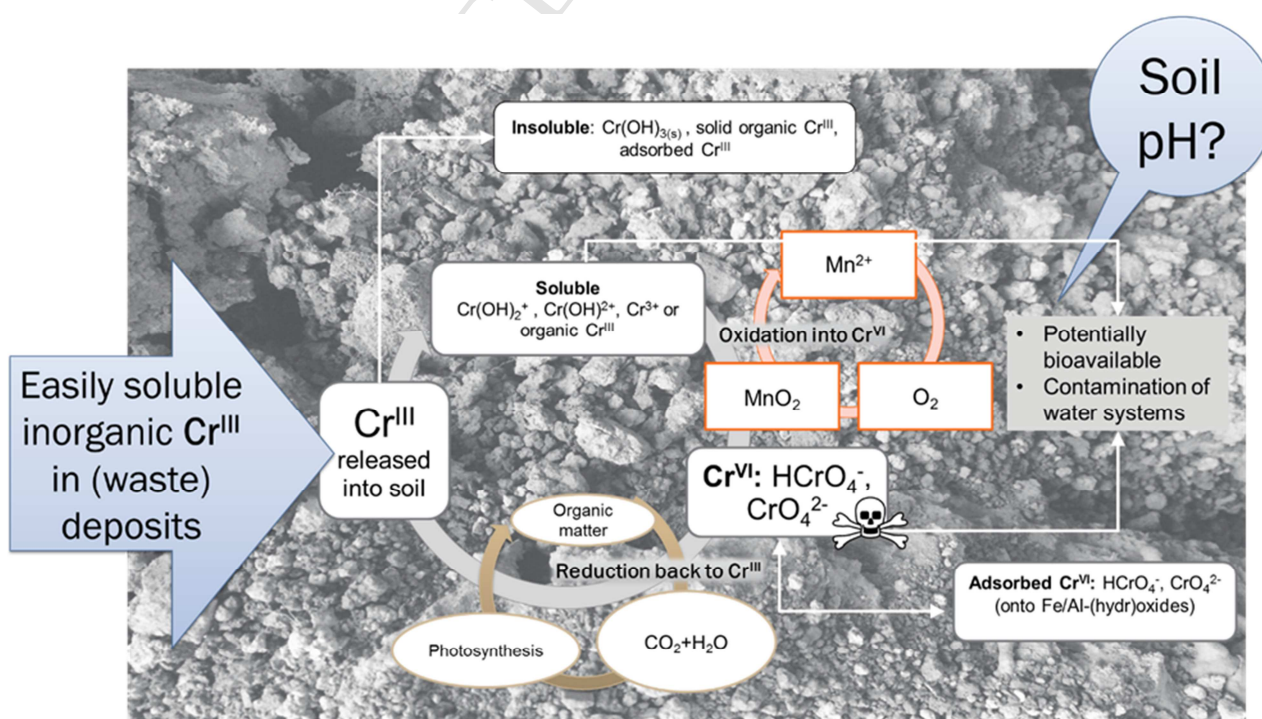
1 Oxidation mechanisms and chemical bioavailability of  
 2 chromium in agricultural soil – pH as the master  
 3 variable

4 KEYWORDS: chromium; oxidation; speciation; soil; bioavailability, chromate; pH; Cr; VI; III;  
 5 species

6 HIGHLIGHTS:

- 7 • Oxidation of Cr<sup>III</sup> into Cr<sup>VI</sup> by MnO<sub>2</sub> is regulated by soil pH
- 8 • Net-oxidation of Cr<sup>III</sup> at low pH is diminished by the subsequent reduction of Cr<sup>VI</sup>
- 9 • Oxidation of Cr<sup>III</sup> is limited by its low solubility and precipitation onto MnO<sub>2</sub>
- 10 • Potential bioavailability of Cr<sup>III</sup> is enhanced by its oxidation into Cr<sup>VI</sup>
- 11 • Risk of Cr<sup>III</sup> oxidation was negligible in agricultural field soil samples without added MnO<sub>2</sub>

12 GRAPHICAL ABSTRACT:



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