SOCORE

Sustained Oxidation and Controlled Oxidant Release Encapsulants



| A PASSIVE REMEDIATION SOLUTION|

Improve ISCO project outcomes while reducing costs

- Independently researched and published by six leading universities including Colorado School of Mines, Ohio State, UNL, Clemson, Purdue, and UNC A&T
- Specialty Earth Sciences, LLC is the developer of SOCORE technology
- Encapsulated reactant technology can provide up to years of controlled oxidant release in saturated soils and groundwater
- Enables the oxidant to penetrate the most challenging geological features including clays, fine silts, bedrock, and other Low Permeability Media (LPM)
- Mitigates contaminant back diffusion commonly associated with traditional ISCO injections
- Passive and effective oxidant delivery throughout the subsurface via advection and concentration-gradient diffusion. Enhanced oxidant release in the presence of non-aqueous phase liquid (NAPL)
- SOCORE materials are installed via boreholes (Direct Push or augers), permanent wells, horizontal drilling, and trenches
- NO PRESSURIZED INJECTION, NO CHEMICAL MIXING, NO DUST, NO SURFACING OF LIQUIDS

WHAT IS SOCORE?

Specialty Earth Sciences has developed techniques to coat oxidant crystalline particles with a benign, non-toxic, biodegradable, water insoluble, food-grade paraffin wax. Potassium permanganate and sodium persulfate are the most common SOCORE oxidants. These coated or "encapsulated" oxidant particles can then be manufactured into a variety of finished products to meet your needs. SOCORE materials are supplied in cylinder (aka "candle") form, in sphere (aka "bead") form, in pellets, or in slabs. Please contact our representatives to discuss your application.



Specialty Earth Sciences, LLC

Environmental Solutions | Technology Development

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REFERENCES

Specialty Earth Sciences IP:

US Patent No:	7,431,849
US Patent No:	8,210,773
US Patent No:	8,366,350
US Patent No:	9,061,333
US Patent No:	9,611,421
Japanese Patent No:	6,058,708
US Pat App No:	12-269,520
US Pat App No:	13-088,217
US Pat App No:	13-731,735
US Pat App No: 1	14-024,046
US Pat App No:	14-920,370
U Pat App No: 09 826 6	642.2-1371

Related Publications:

Christenson et al, The Water Center, 2016 Kambhu et al, *Chemosphere*, 2012, 89, 656-664.

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Christenson et al, *Chemosphere*, 2012, 89, 680-687.

Woo et al, Env Tech, 2009, 30, 1337-1342 Luster-Teasley, Proceedings of 2007 Natnl Conf on Env Sci and Tech.

Lee et al, *Chemosphere*, 2007, 74, 745-750

Lee et al, *Chemosphere*, 2007, 71, 902-910

Lee and Schwartz, *Chemosphere*, 2007, 69, 247-253.

Lee and Schwartz, *Chemosphere*, 2007, 66, 2058-2066.

Ross et al *Journal of Environ. Eng.*, 2005, Vol. 131, 1203-1210.

Kang et al. *Ind. Eng. Chem. Res.,* 2004, *43,* 5187-5193.

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