

## Iron oxide/iron composite material

# Soil/Groundwater Purifying Materials [RNIP®]



### OVERVIEW

“RNIP®” is iron composite nanoparticle which is applied TODA KOGYO’s wet synthesis technologies. It can rapidly purify VOC, Volatile Organic Compounds, and insolubilize heavy metals.

### FEATURES

#### Rapid purification of pollutant

The decomposition rate of TCE (trichloroethylene) is 100 times faster than common iron powder.

#### In-situ purification for deep soil pollution

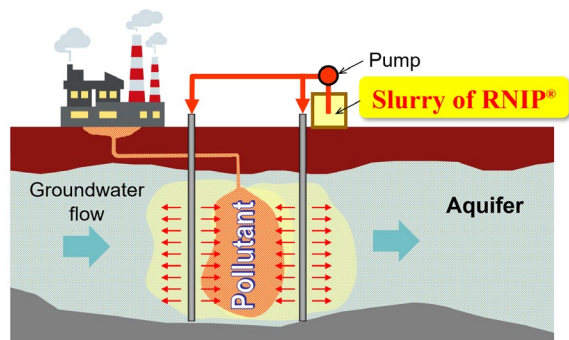
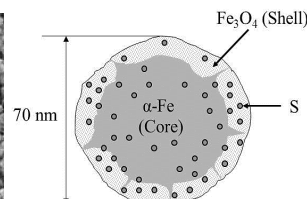
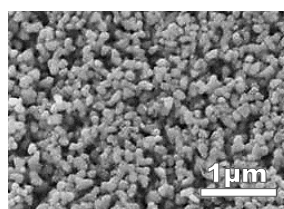
It diffuses easily to soil and purifies VOC and heavy metals pollution at deep places in-situ.

#### No secondly pollution

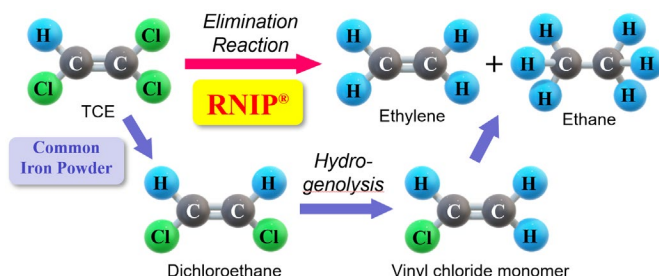
Since RNIP® has no hazardous metals, it’s an eco-friendly material with no secondly pollution.

### CHARACTERISTICS

RNIP® is nanoparticle of core-shell structure of  $\alpha$ -Fe and  $\text{Fe}_3\text{O}_4$  (mean particle size: 70nm, BET specific surface area:  $30\text{m}^2/\text{g}$ ). The slurry of RNIP® (specific gravity: 1.18 to 1.25, solid content concentration: 25wt%) is constructed by such as in-situ injection and purifies pollutant.

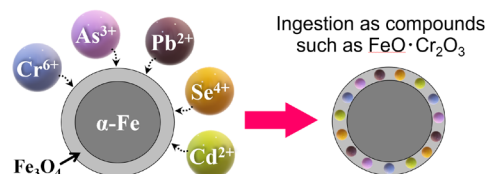


【In-situ injection method】



【Comparison of decomposition of trichloroethylene】

Since RNIP® has high reducing efficiency and increases the rate of decomposition, it suppresses the preparation of harmful chlorides generated during the decomposition of TCE by common iron powder. Also, RNIP® makes heavy metals harmless by ingesting them as insoluble compounds into its surface.



【Image of insolubilization of heavy metal】

### APPLICATIONS

- Purification of small/medium-sized spaces
- Purification of operating factories, under-buildings and boundary areas
- Purification of deep polluted places

RNIP is a registered trademark of TODA KOGYO CORP.

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