IXPER® Calcium Peroxide

Applications

IXPER® 75C Calcium Peroxide is used for **enhanced aerobic bioremediation**. This is a process in which organic contaminants found in soil and/or groundwater are degraded by indigenous or inoculated micro-organisms transforming them to innocuous end products. Enhanced bioremediation with the use of IXPER® 75C Calcium Peroxide is achieved through the **extended release of oxygen** into the subsurface to supplement the rate limiting oxygen requirement by aerobic microorganisms.

The most common pollutants that can be treated include :

- **BTEX** (benzene, toluene, ethylbenzene and xylene)
- **MTBE** (methyl tertiary butyl ether)
- **TPH** (total petroleum hydrocarbons) from **light and heavy fuel oils**
- **Non-halogenated volatile solvents** such as methylethylketone, methanol, ethanol, acetone, ethyl acetate, acetonitrile, tert-butyl alcohol (TBA), etc.
- **Phenols** such as phenol and cresols
- **PAH's** (polycyclic aromatic hydrocarbons) such as naphthalene and methylnaphthalenes
- **Some halogenated compounds** such as vinyl chloride (VC), chlorobenzenes, pentachlorophenol (PCP), etc.

IXPER® 75 C Calcium peroxide can also be used for the chemical oxidation in Ex- or In-Situ remediation of soil/groundwater, by acting as a source of hydrogen peroxide when an acid addition is considered prior, during, or after its injection; alone or in presence of iron ions or chelates in order to generate Fenton's reaction.

Strengths

There are many factors that affect successful treatment using IXPER® 75C Calcium Peroxide. These include :

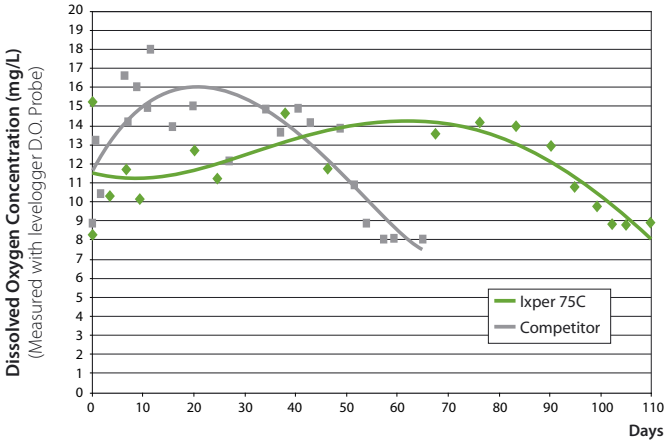
- **Formulation** - IXPER® 75C Calcium Peroxide has a proven extended oxygen release profile.

The following graph compares IXPER® 75C Calcium Peroxide with a competitor product of equivalent particle size in a 1% slurry. It is clear that the competitor's calcium peroxide generated a very high amount of oxygen at the beginning and was depleted in a period that was less than 50% of the time it took to deplete IXPER® 75C Calcium Peroxide from its oxygen. Note that higher concentrations of calcium peroxide take a longer time to release their oxygen content.

- **Concentration** - IXPER® 75C Calcium Peroxide has more active oxygen with a typical 17.3% or higher oxygen content.
- **Solubility** – IXPER® 75C Calcium Peroxide has a very low solubility in water which allows the product to continue to release its active oxygen content for many months.
- **Stability** – the stability of calcium peroxide is also a factor of its formulation. A stable product does not release its oxygen immediately in contact with water. IXPER® 75C Calcium Peroxide is a very stable product with very little foaming propensity when mixed with water.
- **Purity** - IXPER® 75C Calcium Peroxide complies with the Food Chemicals Codex.
- **Particle size** – a small particle size is most suitable for producing homogeneous slurry. It is also essential when the pro-duct is to be injected in the soil allowing for greater horizontal penetration in the soil without clogging the pores.

Calcium Peroxide Comparison

(5.000 g of product placed in an open 1-L container with 500 ml Distilled Water)



Solvay Chemicals

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Technical Information

Formula : CaO_2	**CAS Number :** 1305-79-9	**Molecular Weight :** 72.08

Physical Properties

Item	Typical Properties	Item	Typical Properties
Appearance	Pale yellow amorphous odorless powder	Mean Particle Size	15µ
Morphology	Spherical	Solubility in Water @20°C	<0.01%

Chemical Properties

Item	Typical Properties	Item	Typical Properties
Calcium Peroxide (%)	78 ± 2	Stability in water	High stability in suspension
Available Oxygen (%)	17.3 ± 0.4	pH (25% suspension)	>12

IXPER® 75C Calcium Peroxide decomposes slowly in contact with water with the generation of oxygen and heat. Typically H2O2 is not generated under these conditions due to the high pH.

$$2CaO_2 + 2H_2O \leftrightarrow 2\,Ca(OH)_2 + O_2$$

The rate of gaseous oxygen generation is influenced by the physical and chemical properties of the surrounding medium such as pH, and temperature. If IXPER® 75C Calcium Peroxide is exposed to a lower pH, it can generate increasing amounts of hydrogen peroxide.

$$CaO_2 + 2H^{\leftarrow\leftarrow} \rightarrow Ca^{\leftarrow\leftarrow} + H_2O_2$$

Certifications

- IXPER® 75C Calcium Peroxide is Kosher certified and complies with the specifications of the Food Chemicals Codex for use in dough conditioning.
- The production facilities of IXPER® 75C Calcium Peroxide are ISO 9001:2000 and 14001:1996 Certified.

Packaging

IXPER® 75C Calcium Peroxide C is available in board of 50 kg with 9 boards on a pallet.

Storage and Handling

- Store in a dry location awaty from heat and out of direct sunlight in original containers. Storage temperature: < 40°C.
- Store in an area away from acids, bases, metals, metal salts, reducing agents, organic materials or flammable substances.
- Never return unused product to the storage container.
- Equipment used for handling this material should be made of plastic, stoneware, glass or stainless steel. Enamelled or resin coated equipment is also suitable. Copper and copper alloys should be avoided.
- Holding equipment must be adequately vented to prevent any pressure build up in the event of product decomposition.

Safety

- Ensure all personnel who may come in contact with this material are aware of the potential hazards, first aid measures and the proper storage and use techniques outlined in the most recent Material Safety Data Sheet (MSDS).

SOLVAY CHEMICALS

Solution Unit Soil Remediation
Rue de Ransbeek, 310 - B- 1120 Brussels - Belgium
Tel. +32 (0)2 264.17.34 - Fax +32 (0)2 264.18.05
www.remediation-soil.com

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