

## If you're using Phosphoric Acid...

...get better performance with

## The Gentle Outperformer



### MSA is the Purest Cost-Effective Proton Commercially Available:

- Non-oxidizing, high purity, efficient catalyst – yields low color, high quality products
- Completely soluble in water, forming solutions with high equivalent conductance
- High solubility for alkaline earth and heavy metals
- Readily biodegradable
- A strong acid with an advantaged toxicity and ecotoxicity profile
- Better cost of use

### If you're using Phosphoric Acid, you should know that:

- MSA is a low viscosity liquid with a melting point of  $-60^{\circ}\text{C}$ . Phosphoric acid is a viscous liquid or solid depending on concentration.
- Calcium salts are more soluble in MSA than in phosphoric acid.
- MSA is readily biodegradable. Environmental impacts from manufacture and disposal of phosphoric acid include the problem of algal bloom.
- MSA can be used at up to  $180^{\circ}\text{C}$ , while phosphoric acid boils at  $158^{\circ}\text{C}$ .
- MSA is highly stable to oxidation and reduction.
- Phosphoric acid violently polymerizes under the influence of azo compounds and epoxides. It also decomposes on contact with alcohols, aldehydes, cyanides, ketones, phenols, esters, sulfides, halogenated organics producing toxic fumes.



**A Versatile Green Acid**  
that's The Gentle Outperformer

As a world-scale chemicals activity and the leader in sulfonyls, Arkema brings you a world of innovation. With the use of research and production methods at the leading edge of technology and presence in international markets, a wide range of Arkema's services and solutions are at your disposal.

## Potential uses of MSA instead of Phosphoric acid?

### Cleaners and descalers:

- Household equipment, e.g., copper-ware, steam irons, humidifiers, dishwashers, toilet bowls, tartar removal of false teeth
- Marine equipment, including salt water stills
- Wells (water, oil, and gas)
- Concrete, brick, and other masonry
- Dairy equipment, e.g., pasteurizers, evaporators, preheaters, and storage tanks
- Industrial equipment, e.g., boilers, condensers, heat exchangers, and preheaters, paper-mill equipment, air-conditioning systems
- Food-processing equipment, brewery equipment; sugar evaporators

### Catalyst:

- Replacement of polyphosphoric acid with Eaton's reagent
- Alkylation of Aromatics
- Dehydrogenation, polymerization, and isomerization reactions

### Solubilize Metals

### Metal Surface Treatment:

- Pickling
- Cleaning and electropolishing

### Latex Coagulation

### Electronics (high purity cleaning applications)

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