AMIC
Aplicacions Mediambientals
i Industrials de la Catàlisi

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Vanadium inhibitor in fuels by adding Magnesium Components.

Vanadium is naturally present in fuels in soluble form and its content depends on the type of fuel and its origin. When this fuel is combusted inside a combustion chamber, Vanadium Oxides (V_2O_5) are generated, which can react with other metallic elements present in the combustion chamber, e.g. Sodium, producing complex chemical reactions that generate semiliquid compounds or low fusion point salts that adhere themselves to metallic parts, causing their corrosion.

In order to avoid these corrosion processes, a fuel additive is usually introduced to prevent the formation of this type of low melting point Vanadium Oxides. The most characteristic additives are those that contain some metallic elements such as Aluminum, Magnesium, Barium, Calcium or Silicon. The way in which these additives are found -particles or molecules- is of great importance for the total reaction with Vanadium, generating oxides with high boiling points and eliminating the possible corrosion of the equipment.

The reaction between Magnesium and Vanadium produces the latter's total neutralization by chemical combination, generating stable and non-corrosive Magnesium Vanadates.

The Vanadium inhibitor **"rb bertomeu" beco Mg**, contains Magnesium in molecular form and consequently it delivers a high reactivity with respect to the Vanadium Oxides, producing the corrosion problems elimination.

At power plants with gas turbines powered by heavy fuel oil or crude oil, they use as Vanadium inhibitor a liquid, opaque Oxide or Magnesium Hydroxide suspension, in both cases with <2 microns in 99.9% solid particles, with an active surface area of ≈18 m^2 / gram. With this suspension the required inhibitor dose is determined by the 3 ppm of Magnesium per 1 ppm of Vanadium ratio.

The Vanadium inhibitor **"rb bertomeu" beco Mg** with molecular Magnesium, with an active area of Magnesium molecules of ≈1,800 m^2 / gram, with doses of 7.6 ppm of **"rb bertomeu" beco Mg** per 1 ppm of Vanadium is superior compared to the Vanadium inhibitors that contain Magnesium in micro particles and that are used in the 3 ppm of Magnesium per 1 ppm of Vanadium ratio.

The micrometric particles of solid Magnesium in suspension, due to their size [2 micrometers (µm): 10^{-6} meters] only react superficially and a large part of their mass, which has not reacted, becomes a residue / ash that generates fouling and incrustation in the gas circuit.

The Magnesium molecules of **"rb bertomeu" beco Mg** [72 picometers (pm): 10^{-12} meters] which are 1 million times smaller than the solid particles of 2 microns, react totally and do not generate waste or ash and do not cause incrustations in the gas circuit.

We authorize the dissemination of this document for the purposes of references that you consider appropriate.

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