

عنوان مقاله:

Protection and optimization of equipment from SO_2 and SO_3

محل انتشار:

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خلاصه مقاله:

Corrosion that occurs in concentrated sulfuric acid production plants causes damage to equipment, pipes, tanks, and pumps, which affects the cost of maintenance time, which causes production stoppage and danger to workers due to the high acid concentration. The researchers used several types of alloys that help sustain production with different protection methods. Some of them are expensive, and some are highly corrosive, such as iron alloys, nickel alloys, polymers, and others in factory equipment. The current work is devoted to obtaining an alloy with mechanical and corrosive properties comparable to what is used in the concentrated sulfuric acid production plant in Iraq and the world to be used in the most important components of pipes and tanks to preserve the concentrated acid in the factory. Various alloys of a group of elements with an iron base were used and produced by the powders metallurgy method to achieve this purpose. Mechanical, corrosion tests and inspection (hardness, microstructure, dry slip corrosion, wear/abrasion, slight immersion, and Tafel testing were performed, XRD, EDX, SEM) The alloys used in this research are:

$\text{A} \quad 1 \quad (\% \text{Cr} + 1 \quad \% \text{Ni} + 1 \quad \% \text{Mo} + 0.5 \quad \% \text{Cu} + 0.5 \quad \% \text{Si} + 0.1 \quad \% \text{W} + 0.1 \quad \% \text{Ti} + 1 \quad \% \text{Mn})$

$\text{A} \quad 2 \quad (\% \text{Cr} + 1 \quad \% \text{Ni} + 1.5 \quad \% \text{Mo} + 1.5 \quad \% \text{Cu} + 1 \quad \% \text{Si} + 0.2 \quad \% \text{W} + 0.2 \quad \% \text{Ti} + 1 \quad \% \text{Mn})$

$\text{A} \quad 3 \quad (\% \text{Cr} + 2 \quad \% \text{Ni} + 2 \quad \% \text{Mo} + 2.5 \quad \% \text{Cu} + 0.5 \quad \% \text{Si} + 0.2 \quad \% \text{W} + 0.2 \quad \% \text{Ti} + 2 \quad \% \text{Mn})$

$\text{A} \quad 4 \quad (\% \text{Cr} + 2 \quad \% \text{Ni} + 1 \quad \% \text{Mo} + 3.5 \quad \% \text{Cu} + 1 \quad \% \text{Si} + 0.2 \quad \% \text{W} + 0.3 \quad \% \text{Ti} + 2 \quad \% \text{Mn})$

$\text{A} \quad 5 \quad (\% \text{Cr} + 3.5 \quad \% \text{Ni} + 1.5 \quad \% \text{Mo} + 4 \quad \% \text{Cu} + 0.5 \quad \% \text{Si} + 0.5 \quad \% \text{W} + 0.5 \quad \% \text{Ti} + 3 \quad \% \text{Mn})$

$\text{A} \quad 6 \quad (\% \text{Cr} + 3 \quad \% \text{Ni} + 2 \quad \% \text{Mo} + 3 \quad \% \text{Cu} + 0.5 \quad \% \text{Si} + 1 \quad \% \text{W} + 1 \quad \% \text{Ti} + 3 \quad \% \text{Mn})$

$\text{A} \quad 7 \quad (\% \text{Cr} + 4 \quad \% \text{Ni} + 1 \quad \% \text{Mo} + 4 \quad \% \text{Cu} + 1 \quad \% \text{Si} + 2 \quad \% \text{W} + 1.5 \quad \% \text{Ti} + 2 \quad \% \text{Mn})$

$\text{A} \quad 8 \quad (\% \text{Cr} + 5 \quad \% \text{Ni} + 1.5 \quad \% \text{Mo} + 3 \quad \% \text{Cu} + 1 \quad \% \text{Si} + 1.5 \quad \% \text{W} + 2 \quad \% \text{Ti} + 3 \quad \% \text{Mn})$

$\text{A} \quad 9 \quad (\% \text{Cr} + 5 \quad \% \text{Ni} + 2 \quad \% \text{Mo} + 4 \quad \% \text{Cu} + 0.5 \quad \% \text{Si} + 2 \quad \% \text{W} + 3 \quad \% \text{Ti} + 3 \quad \% \text{Mn})$

$\text{A} \quad 10 \quad (\% \text{Cr} + 5 \quad \% \text{Ni} + 2 \quad \% \text{Mo} + 4 \quad \% \text{Cu} + 0.5 \quad \% \text{Si} + 2 \quad \% \text{W} + 3 \quad \% \text{Ti} + 3 \quad \% \text{Mn})$

... Ni

کلمات کلیدی:

Corrosion, Sulfuric Acid, Alloys Elements, Coating, Cathodic and Anodic Protection, Or Appropriate Design, Powder metallurgy, Mixing, Compacting, Sintering, XRD, EDX, Tafel, Hardness, Wear

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