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REMOVAL OF RUST BY VARIOUS METHODS

Prof. Manasi Ghamande[1],Gaurav Gorhe[2], Jai Patel[3], Devashish Pande[4], Pooja Mehtre[5], Deepali Awghade[6]

[1,2,3,4,5,6]*Vishwakarma Institue Of Technology,*

Department Of Engineering Science And Humanities, Pune, (India)

ABSTRACT

Iron oxidation, known as rust formation, causes enormous loss in term of property damages and associated economic risks. Depending on the degree of formation, rust consists of several layers of iron in different oxidation states. The brownish top layer is mostly iron (III) oxide-hydroxide [Fe(OH), Fe(OH)3] while the deepest black layers possess iron oxide (Fe2O3.nH2O). The flaky nature of surface rust meditates diffusion of oxygen and water to inner material sections which can lead to total disintegration of iron mass. As a result, it is desirable to remove rust and protect fresh surface from oxidizers. The common rust removal reagents are mainly based on complex formation of ferric ion with organic and inorganic acids such as citric acid, oxalic acid, and phosphoric acid. Rust removal ability is typically a qualitative observation which makes direct comparison between treatment options cumbersome if not impractical. In our recent project we are using some different method to remove rust which are household method and easy and cheapest ways to remove rust.

I.INTRODUCTION

PROBLEM

Rusting is a specific kind of corrosion which applies to iron-containing metals.

Rusting has a number of effects on metal objects. It makes them look orange and rough. It makes them weaker, by replacing the strong iron or steel with flaky powder. Some oxides on some metals such as aluminum form just a thin layer on top which slows down further corrosion, but rust can slowly eat away at even the biggest piece of iron. If a piece of iron's strength is important for safety, such as a bridge support or a car's brake caliper, it is a good idea to inspect it for rust damage every now and then.

Rust also can cause metal parts that are supposed to slide over one another to become stuck. Just ask someone who has tried to get a rusty nut unstuck from a rusty bolt. 8

Rust is an insulator, meaning that it doesn't conduct electricity easily, unlike iron, which is a metallic conductor. So if some electrical connection is made with iron, it's likely to go bad when the iron surface rusts.

So accumulation is very dangerous and is very essential to remove it. By using domestic methods we can easily remove the rust.

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II.MATERIALS AND REAGENT USED –

1) Rusted metal scraps
2) Lemon(or lemon juice)
3) Salt
4) Baking soda
5) Water
6) Potato
7) Few Tamarinds
8) Brush and Cloth

III.METHODS TO REMOVE RUST

1) SALT + LIME JUICE –

The lime juice and salt combo is very useful to remove rust stains from certain fabrics and carpets. Rust stains are generally very difficult to remove as the stain would contain tiny iron oxide particles. To remove the stain, start by applying lime juice to the stain. Sprinkle some salt over this. Allow the salt and lime juice to react on the stain for at least a day's time. Wet the spot with more lemon juice to keep it damp. Blot the stain well and repeat the process if needed. You can see the stain disappear very quickly.

As we are using acidic medium we have to clean the surface with cloth.

BEFORE AFTER

Fig. Rust removal by Salt and Lime Juice.

2) BAKING SODA + WATER (OR LIME JUICE) –

Rinse the metal item and shake dry. Dust with baking soda (it will stick to the damp areas), making sure to cover all rusty areas. Leave the item for an hour or so, then scour with steel wool or a metal brush, removing the rust down to the metal. (If cleaning a pan, use a scouring pad.) Rinse, and towel dry.

BEFORE AFTER

Fig. Rust removal by Baking soda and Water.

3) POTATO + DISH SOAP –

Cut a potato in half, and then dipping in dish soap or baking soda. then apply the soaked end to the rusted area and rub. To keep going, just cut the potato's upper layer and re-apply the soap .This method is most effective for cooking vessels.

BEFORE AFTER

Fig. Rust removal by Potato and Dish Soap.

4) TAMRIND WATER –

Boil some ripe tamarind in water and apply this water on rusted item. Scrub the rusted area with brush. We have to remove remnants of tamarind. Doing this is necessary because tamarind is acidic.

BEFORE AFTER

Fig. Rust removal by tamarind water.

IV.CONCLUSION

The process we have used are very simple, domestic, and no laboratory grade chemicals are used.
All the substances used are cheap, and easily available in market. All the small instruments, kitchen wares can be easily clean.
Also the rusted parts of vehicles, cars, metal sheets can be clean by these methods.

The limitations of these processes are that this processes can't use for highly rusted parts because we are using domestic materials which aren't useful for them.

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