

A description of molten aluminum poured onto rusty steel

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The following is a description of melting aluminum. In the shop we have a pot that we welded up that has stainless steel sides and a mild steel bottom with an eight inch handle. This pot is heavy duty with $\frac{1}{4}$ inch-thick sides and the bottom is about $\frac{3}{8}$ inch thick. We put the aluminum pieces (these pieces were about $\frac{1}{2}$ "x 3" x 4") in the pot and then began to heat the pot with an oxygen/acetylene torch. As the pot and aluminum were heated we noted some changes. As more heat was applied the color of the steel changed to a deep red and then continued to an orange color as the heat increased.

The aluminum on the other hand changes very little in appearance when heat is applied. The outside oxide layer changes to a very faint straw color and then as the heat increases the inside of the aluminum will melt first and the outside oxide layer will appear as dirty contamination and will not mix with the more pure molten aluminum. The melted aluminum did *not* change in color other than take on the appearance of mercury or a "clean" and "pure" silvery color. This melting was done near a large window with outdoor exposure during the day, so we had plenty of daylight lighting.

When the aluminum was completely melted we poured the molten aluminum out and it retained the silvery color (like mercury) even though the steel pot was glowing orange-hot. The melted aluminum was poured onto rusty mild-steel (see photographs) and soon after the aluminum made contact with the steel and flowed a bit, the aluminum solidified and looked very much like it did before we put the heat to it.



In conclusion, when aluminum is heated to the point that it melts it does not change a whole lot in appearance. The color pretty much stays the same and any slight change that does occur is due to the outside or oxide layer and the impurities that are in that oxide layer. Also, there were no obvious chemical reactions between the hot liquid aluminum and the rusty piece of angle-iron, even when the angle-iron was pre-heated with a torch.