

THE USE OF THE BRAZILIAN CARNAUBA WAX AS A PROTECTIVE COATING TO PREVENT CORROSION OF METEORITES AFFECTED BY CHLORIDES

M. E. Zucolotto¹ and A. C. Fonseca¹ - 1-Museu Nacional/UFRJ.
E-mail: mezucolotto@globo.com.

Iron meteorites found in humid environments are more susceptible to an aggressive form of rusting involving chloride. The first “symptom” is the exudation of a greenish aqueous solution from the meteorite, very well known by curators as “Lawrencite disease” as previously attributed to Lawrencite [1] and now to Akaganeite [2]. It is an electrochemical process involving chloride contamination which works in the following way: the ferric chloride solution oxidizes to form a ferrous chloride solution, which in turn reduces in the presence of iron to form more ferric chloride fast destroying the meteorite [3].

As the reaction requires both oxygen and water to proceed, most attempts to control the deliquescence have concentrated on removing the specimens from air and humidity by many ways as coating the specimens with various sealants as oil, polyurethane and others. It is also common the use of controlled cabinets. Here is evaluated the removal of chloride followed by a protective coating with carnauba wax.

The Nova Petropolis, a Brazilian meteorite just after been found, was venerated by the fact the inhabitants thought the stone was crying. Since its arrive to Museu Nacional in 1988 many attempts to stop the deliquescence were performed, but re- incidentally it begins to rust again. Indeed we verified that a polished briquette from the inner part of the meteorite is very well preserved for more than 20 years, which proves that the very evasive chlorine contamination came from the border to the core.

In order to remove the contaminated outer surface many efforts were done as the mechanical use of wire brushes and sanding, after each process the meteorite was covered by resin. This procedure works for a time till a new layer of oxide becomes to form in some places and crack the resin, possibiliting the meteorite exposition to humidity.

An electrolytical cleaning based on **techniques of preserving Archaeological material from marine sites [4] were performed. This process was followed by a galvanic treatment [4,5] and a posterior coating protection with resin. It worked for about three years but the corrosion restarts in some spots although more weak. Meanwhile for exhibition purpose a natural-looking is desirable so we tried the use of a Brazilian wax from Carnauba tree, with samples of Campo del Cielo, Brahin, and sections of Nova Petropolis with very good results. The Carnauba wax made a complete vedaion and the meteorite keeps its natural aspect. It is also reversible, and transparent to translucent, so that any corrosion can be quickly detected.** The results were so promissor that we performed with the main mass of Nova Petropolis.

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