

HGM005-P10

Room: Convention Hall

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Change in Iron with Ultraviolet Rays and Water

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Since 2002 I have been examining the influence that ultraviolet rays and water exert on the rock etc. in junior high school science club. This time, our aim was to irradiate ultraviolet rays onto an iron plate immersed in distilled water and to examine the change.

To understand the affect of ultraviolet rays and water on iron within rock, I think it was necessary to first examine the affect on pure iron.

In this experiment, an iron plate was put in a test tube filled with distilled water. Next ultraviolet rays (c) were irradiated onto the test tube. The peak wavelenge of ultraviolet rays (c) was 254 nm. The iron purity was 99% or more.

As a control an identical iron plate was immersed in distilled water, but with no ultraviolet expose. Ultraviolet rays (c) were irradiated for five months. The mean illuminance of ultraviolet rays c was 20w/m².

As a result of this experiment a lot of reddish-brown powders were generated in the test tube that irradiated ultraviolet rays. X-ray diffraction analysis revealed that the powder was goethite and magnetite. In the test tube that was not expose to ultraviolet rays, puce powders were generated. The X-ray diffraction analysis revealed that the powder was goethite only.

In conclusion we have demonstrated that when ultra violet rays are irradiated onto iron immersed in distilled water, the amount of iron oxide produced is greater than when no ultraviolet rays are irradiated.

It is presumed that water existed in the past on the surface of Mars. I think that there is a possibility that magnetite was generated by ultraviolet rays and water on Mars surface.

Keywords: iron plate soaked in distilled water, ultraviolet rays c irradiation, magnetite, goethite, Mars surface