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Author: Prof. Ettore Antolini
ASI - Italian Space Agency, Italy

Mr. Valentino Espinosa
Italy

INFINITY: A SCHOOL IN SPACE!

Abstract

From the observation of the chemical components surrounding the comets, the presence of O2, very rare in a space environment, was noted, trying to trace the possible process at the origin of the presence of O2. It was discovered that bonds present in CO2 on the comet's surface can be broken to create O2. The key is the energy that molecules can have to carry out a chemical reaction. Water molecules are found around comets, these are accelerated by the interaction with the solar wind and end up colliding at high speed against the comet itself. If the collision occurs with oxygen-rich compounds, such as sand or rust, the water molecule is able to tear apart the oxygen atoms and recombine them to obtain molecular oxygen. On the same theoretical model, researchers from the California Institute of Technology (Caltech) have proposed a similar system, like a small particle accelerator (albeit with much lower energies) where carbon dioxide molecules collide at high speed and the target is the inert surface of a gold leaf. At the right energies, the CO2 molecule bends and "breaks", allowing its two oxygen atoms to recombine and thus produce molecular oxygen.The dissociation of CO2 can occur in many ways based on the energy supplied to the molecules, we can have a partial dissociation (with consequent formation of CO+O for an energy requirement...) or total (C+O+ Or for a requirement of...). However, for the formation of O2, intermediate energy values are needed which ensure that the oxygens that make up CO2, after breaking the double bonds that keep them bound to the carbon atom, form a double covalent bond. What happens is that the accelerated particles, hitting the CO2 molecules, oriented at a certain angle, are accelerated and collide with the gold, which acts as a shock barrier and breaks the double bonds between oxygen and carbon. The prototype we created to test this probe phenomenon is composed of 4 sections: central body, reaction bodies, shock attenuator and balloon. The central box is equipped with GPS and camera and acts as an anchor for the rest of the components. The reaction bodies were supplied by Leonardo S.P.A and are glass "bowls" containing only CO2 and gold leaf. The formation of O2 is achieved by the mechanism described above. The only differences are the particles that accelerate the molecules (in the case of the probe, cosmic rays).