Hydrogenation During Stellar Evolution/Planet Formation

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Abstract: In stellar metamorphosis it is theorized that star evolution is planet formation itself. This being said, much of the hydrogen of the star combines with other elements and molecules. This can happen even more effectively through hydrogenation.

In chemistry, hydrogenation is a chemical reaction between molecular hydrogen H_2 and another compound or element, usually in the presence of a catalyst such as nickel, palladium or platinum. The process is commonly employed to reduce or saturate organic compounds. Hydrogenation typically constitutes the addition of pairs of hydrogen atoms to a molecule, often an alkene. Catalysts are required for the reaction to be usable; non-catalytic hydrogenation takes place only at very high temperatures. Hydrogenation reduces double and triple bonds in hydrocarbons.

In stellar metamorphosis, the younger and intermediate aged stars have lots of gaseous hydrogen in their outer atmospheres. When an iron/nickel meteor slams into the atmosphere, a great amount of heat is produced allowing for the hydrogen in the atmosphere to recombine with all the different types of molecules in the atmosphere and in the meteor itself. Even if a large portion of the meteor does not burn up, the surface of it will act as a catalyst for hydrogenation of other types of molecules, as it can be comprised of nickel, palladium or even platinum which are heavy elements found in heavy meteorites.

Given many millions of years of this process, a wide range of molecular combinations can be formed alongside and with the hydrogen gas. As this occurs, and the gravitation of the star diminishes and it loses mass, there is less and less hydrogen available to create new molecules, so the meteors then continue to slam into the star, but do not form any significant amount of new molecules. They just remain on the surface to be picked up by whatever natural erosion processes are available.

According to the diminishing solar abundances principle, the star will increase its heavy element ratio as the hydrogen is lost, meaning the hydrogenation of incoming material will diminish exponentially. The hydrogenation of incoming material could also explain why there is oil and natural gas (which are formed absent decaying organic material) underneath the crust of the Earth by many miles. The hydrogenation of carbonaceous chondrites led to increased production of long chain hydrocarbon molecules, which then rained down into the interior of the star, becoming trapped by in-falling oxygenated compounds (rocks and minerals). As well, if there happens to be evidence of large amounts of hydrocarbons on an object, then chances are it possessed a large hydrogen envelope at one point, thus also meaning its gravitation was a lot stronger, leading to the star having been much larger to prevent atmospheric escape of that hydrogen gas.

To form the chemicals found in ancient stars, the most basic principle of stellar evolution also provides that the vast majority of chemicals found on the Earth formed inside of stars (due to chemical reactions), as the Earth itself is an ancient star at the very end of its evolution.