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## Hydrogen storage in diamond powder utilizing naf for fuel cell applications

Hydrogen Fuel Cells offer the vital solution to the world's socio-political dependence on oil. Due to existing difficulty in safe and efficient hydrogen storage for fuel cells, storing the hydrogen in hydrocarbon compounds such as artificial diamond is a realistic solution. By treating the surface of the diamond powder with NaF with plasma, the surface of the diamond is cleaned of unwanted molecules. Due to fluorine's electro negativity, the diamond powder is activated and ready for hydrogen absorption. These diamond powder pellets are then placed on a graphite platform that is heated by conduction in a high voltage circuit made of tungsten wire. Then, the injection of hydrogen gas into chamber allows the storage of the H<sub>2</sub> on the surface of the diamond powder. By neutron bombardment in the nuclear reactor, or neutron activation analysis, the samples are examined for parts per million amounts of hydrogen in the sample. NaF surface treatment allows for higher mass percentage of stored hydrogen in a reliable, resistant structure, such as diamond for fuel cells and permanently alters the diamonds terminal bonds for re-use in the effective storage of hydrogen.