

## **Production of High Pressure Hydrogen by Molten Salt Gasification of Carbon Bearing Compounds**

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Western Hydrogen Limited (WHL) is developing a new method of generating hydrogen. The new process is called Molten Salt Catalyzed Gasification (MSG) and allows the production of high pressure hydrogen, CO, and CO<sub>2</sub> at ~2000 psi. The MSG process has been proven on a variety of low value (e.g. vacuum residual) carbon based feedstock. The very high thermal efficiency (i.e. theoretical 86%, expected 61%) of the process results in efficient use of resources when creating the hydrogen and a low per unit cost for the hydrogen produced. The MSG process occurs at pressure in a single reactor but occurs in two steps. The laboratory results indicate that the net of the two reactions is slightly exothermic. The favourable chemical kinetics of the sodium–water reaction allows the use of small reactors to generate large volumes in a continuous process. The advantage of the high pressure is the ability to directly produce a stream of pressurized hydrogen. Based on laboratory results, hydrocarbon contamination of the input water does not affect the reaction and actually has the beneficial effect through a sodium hydroxide – carbon reaction. The feeds to the process are water and a carbon bearing material (e.g. vacuum residual, coke, or coal). The presentation will describe the process, the laboratory work, and the pilot plant that is currently under construction near Fort Saskatchewan, Alberta.