CLEAN HYDROGEN PRODUCTION (ONLY!) FROM HEAVY OIL RESERVOIRS

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The oil sands deposits in Western Canada not only represent a vast store of hydrocarbons (oil) that can be converted into fuel and petrochemicals but also a vast hydrogen store – a super clean valuable energy vector and chemical feedstock. With the need to find new energy recovery processes for oil sands reservoirs that have low energy and emissions intensities, hydrogen production is a viable alternative for energy production from heavy oil and oil sands reservoirs by using in situ gasification technology. Gasification reactions, together with the water-gas shift reaction, enable the generation of hydrogen from both bitumen and water within the oil sands reservoir. With hydrogen separation membranes in the production wells, other products from the reactions remain in the reservoir. Thus, there is potential for hydrogen production processes from oil sands reservoirs. The research documented here describes an optimized design for an in situ gasification of bitumen process for surface production of hydrogen only as well as a operating design for application in a heavy oil reservoir located in Saskatchewan, Canada.