

Heat Pump Application in Metal Hydride Compression for Hydrogen Storage

Authors: Arjun J, Tony K P

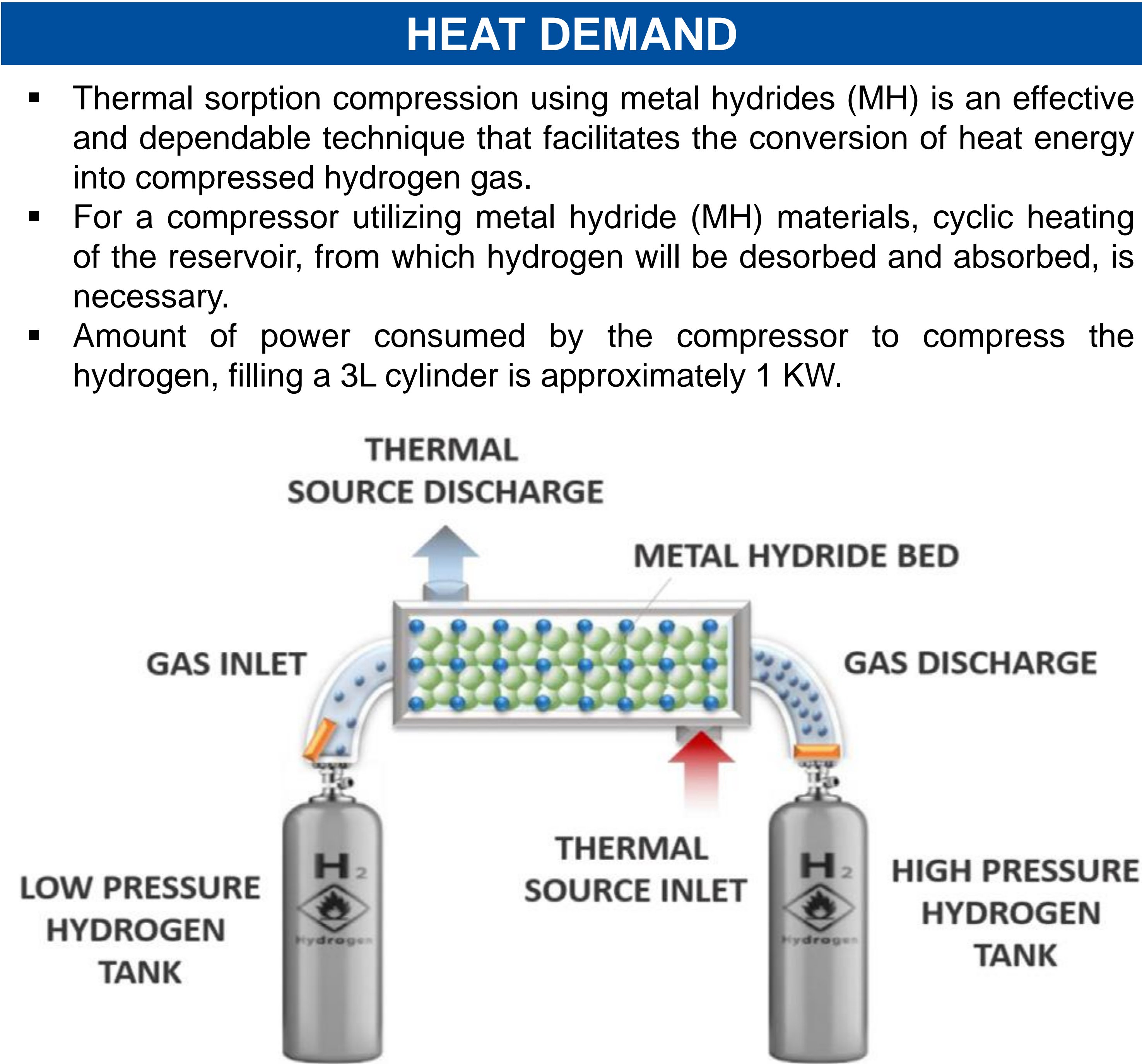


Fig.1. Schema of a single-stage metal hydride hydrogen compressor. [1]

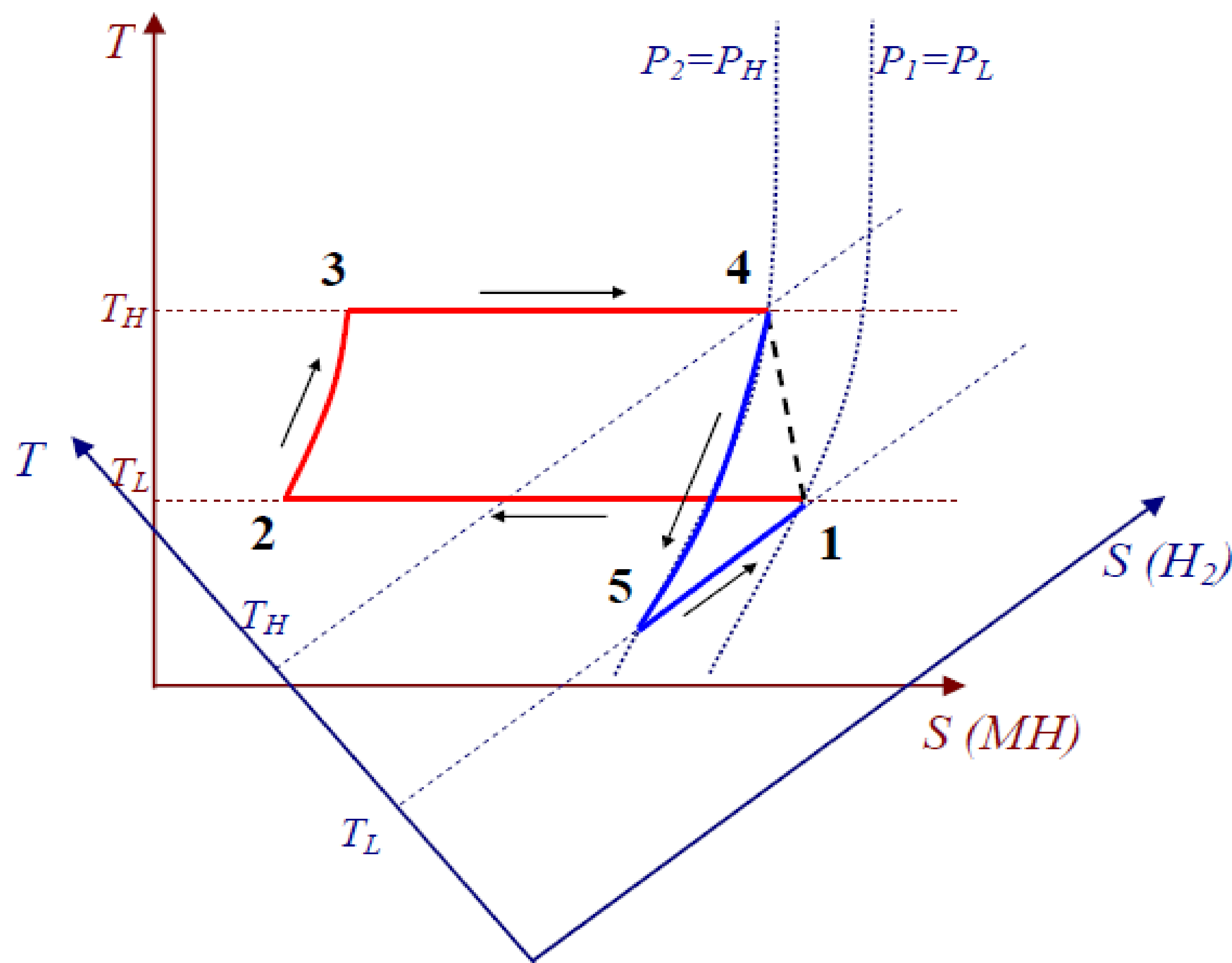


Fig.2. T-S diagram of the operation of an idealized MH compressor. [2]

PARAMETERS INITIALLY ASSUMED CONSTANT	Unit
HEAT DELIVERED	1 KW
COMPRESSOR EFFICIENCY	80%
EVAPORATION TEMPERATURE	2 °C
CONDENSATION TEMPERATURE	50 °C
SATURATED GAS STREAM	100%
SATURATED LIQUID STREAM	0%
PRESSURE RATIO	100%

Conclusion

- The efficiency obtained is around 70% .
- Even though the selected heat pump belongs to domestic range, it provides satisfactory results for metal hydride hydrogen compression.

Reference

[1] G. Sdanghi et. al., Review of the current technologies and performances of hydrogen compression for stationary and automotive applications; Renewable and Sustainable Energy Reviews Volume 102, March 2019, Pages 150-170.
[2] M.V. Lototsky et. al., Metal hydride hydrogen compressors: A review; International Journal of Hydrogen Energy Volume 39, Issue 11, 4 April 2014, Pages 5818-5851

ecoGEO B/C 1-6 PRO	
SOURCE	GEO THERMAL HEAT
REFRIGERANT	R290
COP, B0W35	4.3
HEATING POWER OUTPUT	B0W35
BRINE INLET TEMPERATURE RANGE	-25 °C to 35 °C
HEATING OUTLET TEMPERATURE RANGE	20 °C to 75 °C

Results

