

SUPPORTING INFORMATION

Modeling phase equilibrium of hydrogen and natural gas in brines:

Application to storage in salt caverns

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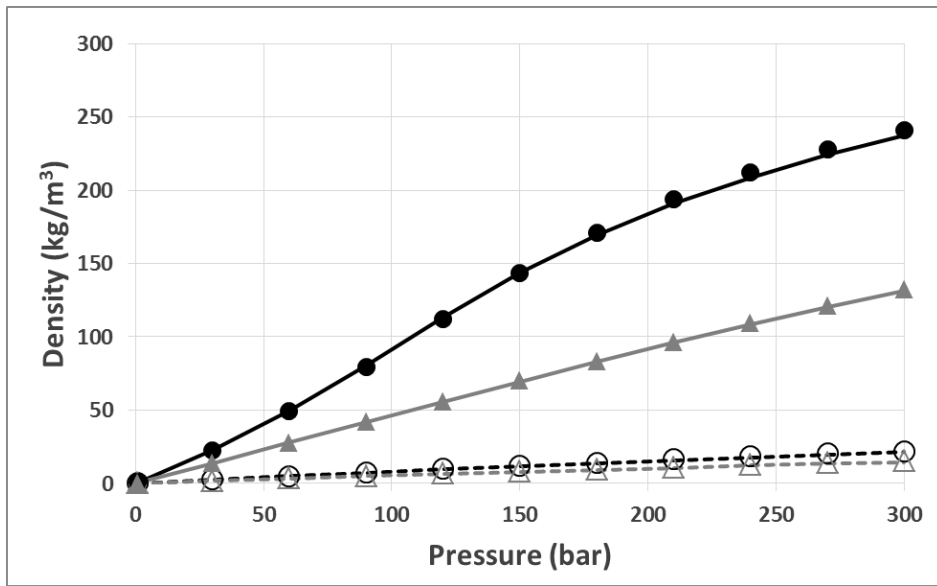


Figure S.1. Density of pure hydrogen (dotted lines) and pure methane (solid lines). Symbols: reference data [34] at 0 °C (triangles) and 150 °C (circles). Lines: this model.

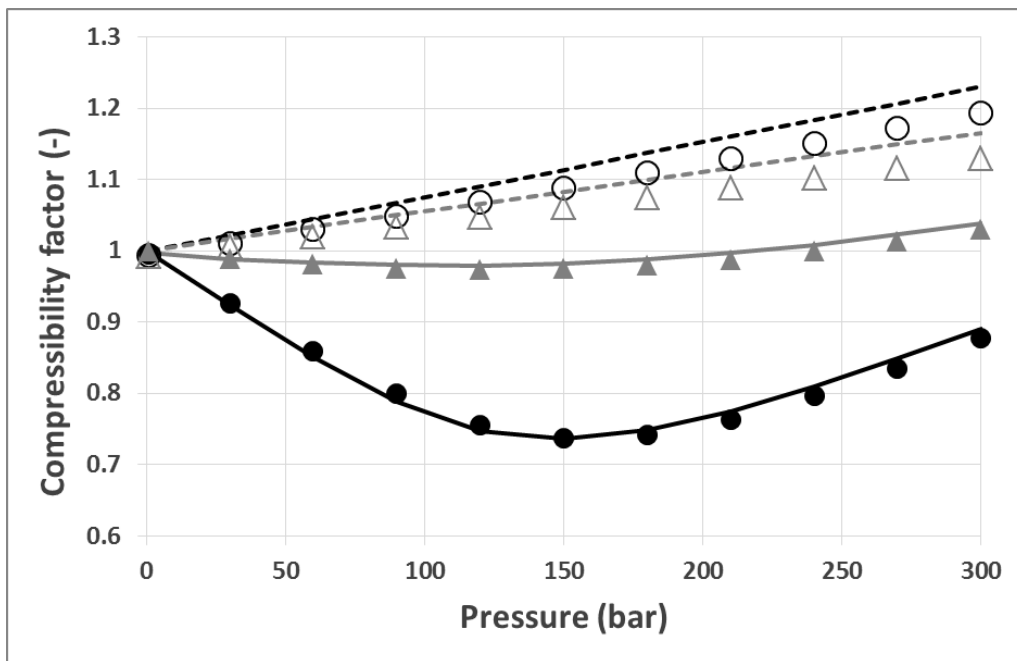


Figure S.1. Compressibility factor of pure hydrogen (dotted lines) and pure methane (solid lines). Symbols: reference data [34] at 0 °C (triangles) and 150 °C (circles). Lines: this model.

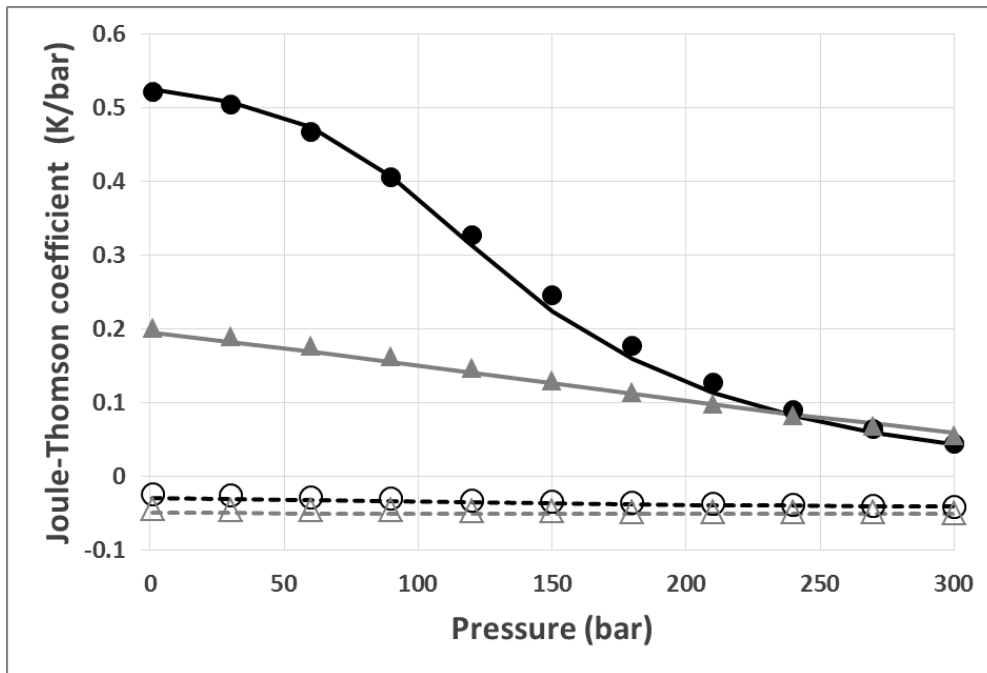


Figure S.2. Joule-Thomson coefficient of pure hydrogen (dotted lines) and pure methane (solid lines). Symbols: reference data [34] at 0 °C (triangles) and 150 °C (circles). Lines: this model.

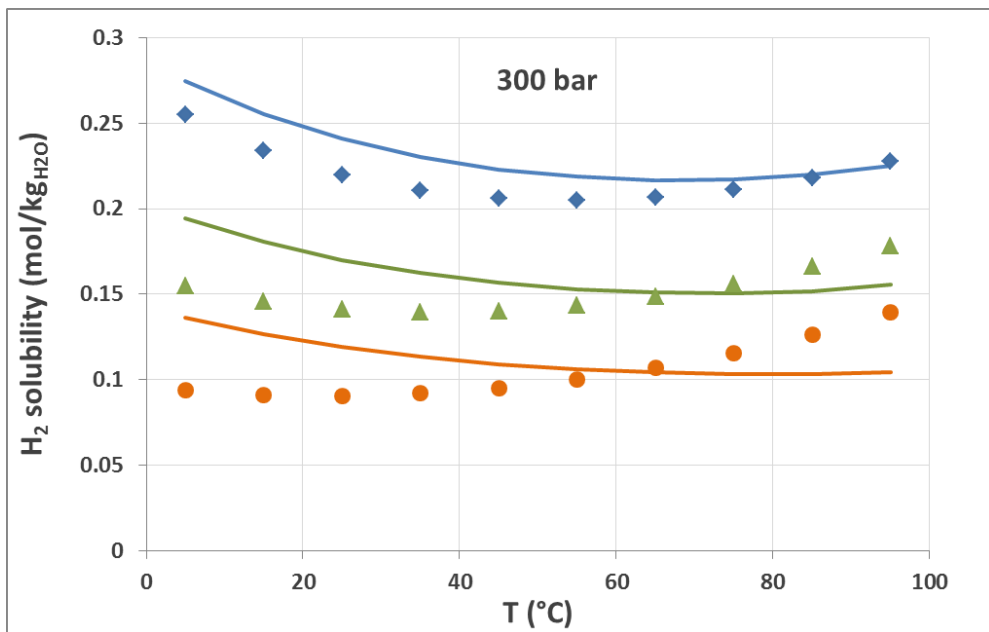
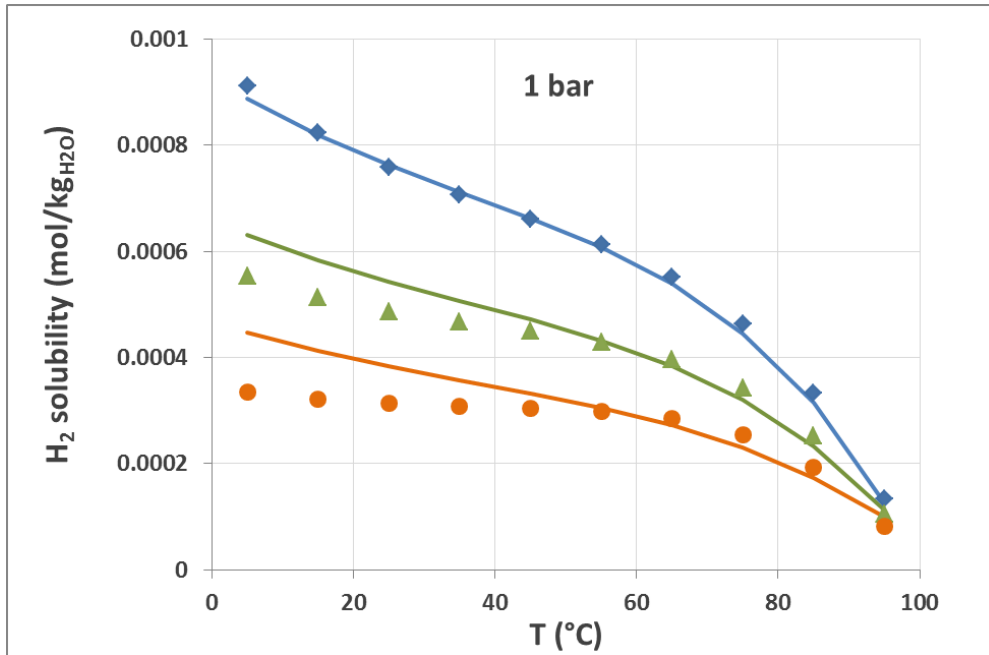


Figure S.4. Hydrogen solubility calculated with the Li *et al.* model [24] (symbols) and by our model (solid lines), at 1 bar (up) and 300 bar (down). Blue diamonds: in pure water. Green triangles: $m_{NaCl} = 2$ mol/kg_{H₂O}. Orange circles: $m_{NaCl} = 4$ mol/kg_{H₂O}.

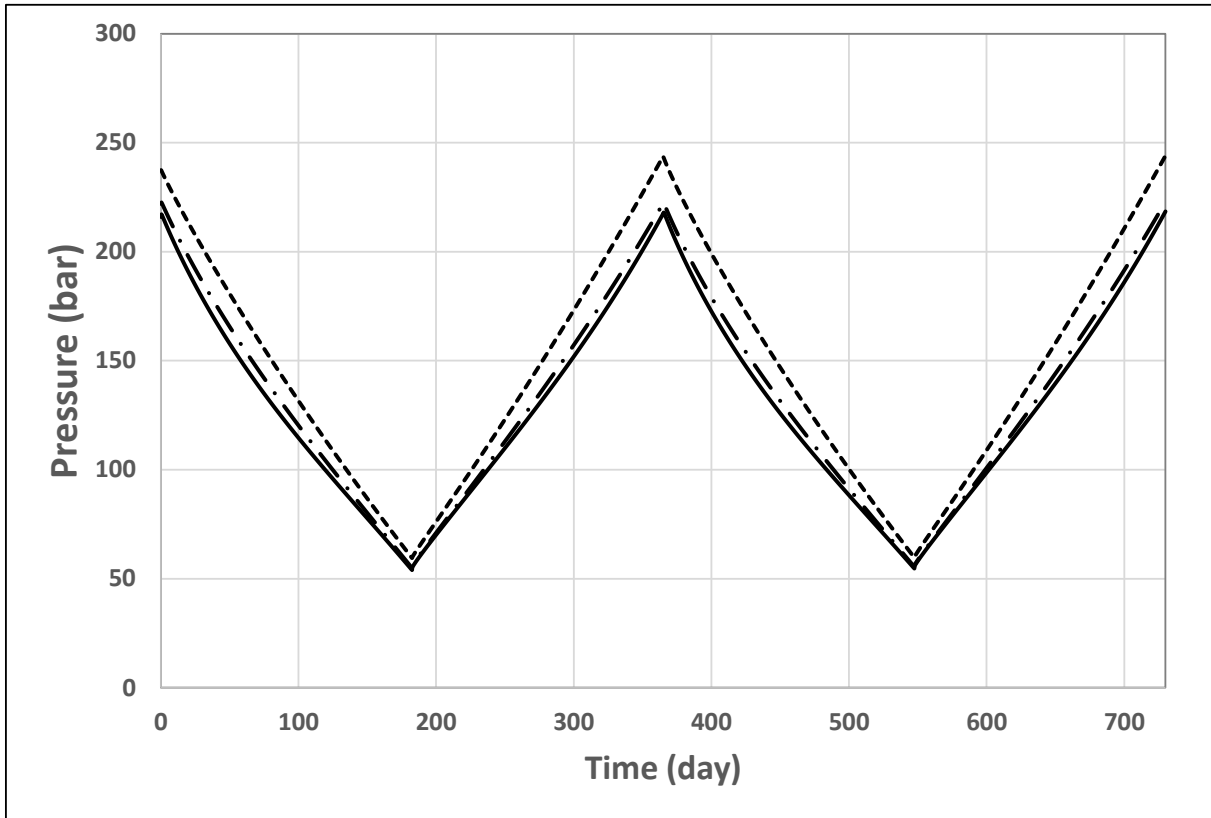


Figure S.5: Variations of well-head pressure for methane (solid line), hydrogen (dotted line) and mix (dash-dotted line).

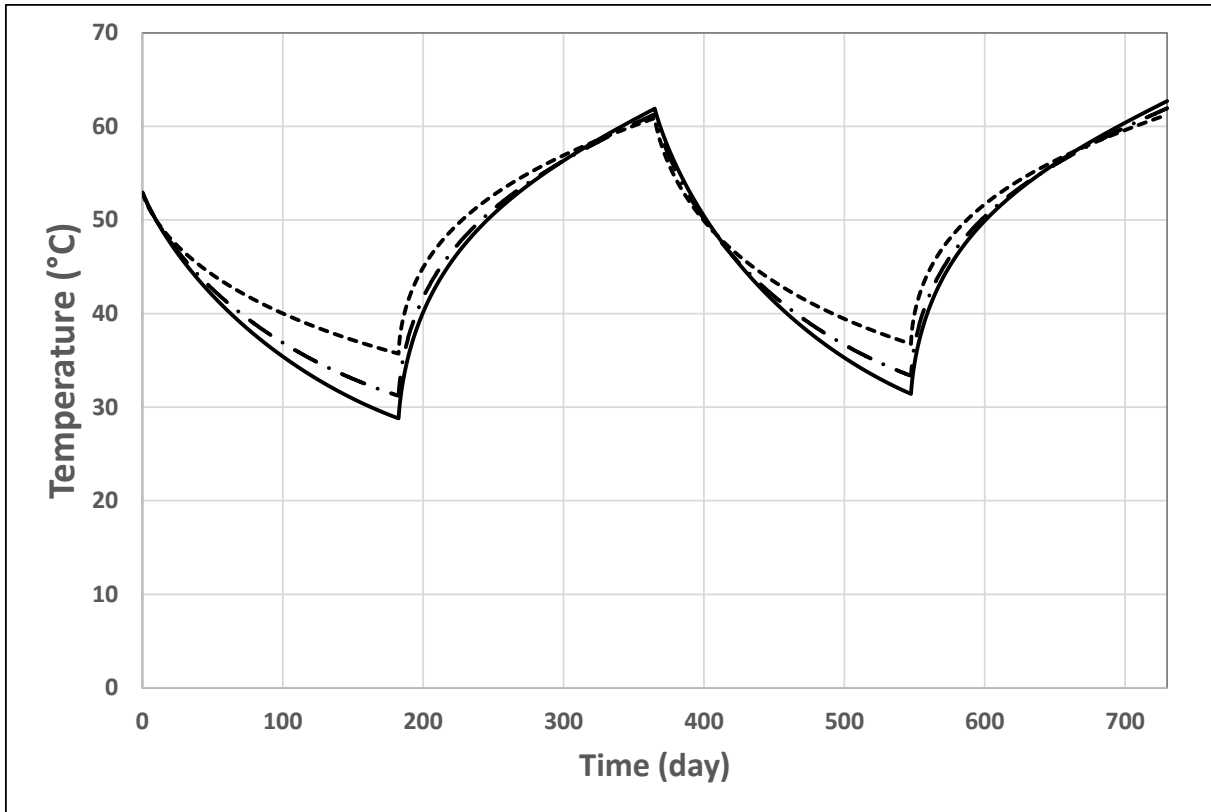


Figure S.6. Variations of cavern temperature for methane (solid line), hydrogen (dotted line) and mix (dash-dotted line).