Summary

1. Compression of a weak polyelecyrolyte and hydrophobic gel initiates first order phase transition, which happens at certain p_{tr} and separates two states of a gel

2. The transition hapens due to an interplay between electrostatic and hydrophobic interactions

3. The transition separates two states:
   - swollen and significantly charged gel
   - collapsed and almost fully discharged gel

4. The value of transition pressure depends on c_s and χ (and pH-pK)

5. Employing the phase transition halps to significantly decrease the pressure used in desalination cycle and to limit it within 0 and 1 bar

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