



COP refrigeration

Refrigerant-134a enters the compressor of a refrigerator as a saturated vapor at 0.12 MPa (point 1) and leaves as a superheated vapor with $T = 50^\circ C$ at 0.9 MPa (point 2). It is then isobarically cooled in the condenser to a saturated liquid state (point 3) and finally an expansion valve reduces the pressure to 0.12 MPa (point 4). The next few questions will be about this cycle, so it might be convenient to make a table with all the information.

What is the COP of this refrigeration cycle?

Dividing the extracted heat (135.37 kJ/kg) by the power input (47.8 kJ/kg) gives the COP: $\frac{135.37}{47.8} = 2.83$