



## Heat removed from low temperature reservoir

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.

How much specific heat is removed from the low temperature reservoir (in kJ/kg).

In this case we are interested in the difference in enthalpy between point 1 and point 4. For point 1 the enthalpy is easy to look up, table 12 gives  $h_1 = 236.99 \text{ kJ/kg}$ . At point 4 we find an enthalpy equal to point 3, once again we look in table 12 and find  $h_3 = h_4 = 101.62 \text{ kJ/kg}$ .

$$h_1 - h_4 = 236.99 - 101.62 = 135.37 \text{ kJ/kg}$$