23. From the data listed, calculate the total heat, in Joules, to convert 10.0 g liquid ethanol at 55.0°C to gaseous ethanol at 95.5°C.

Boiling point of ethanol at 1 atm 78.5°C

ΔH_{vap}: 40.5 kJ/mol

C_{sp} = 2.45 J/g°C for liquid ethanol

C_{sp} = 1.43 J/g°C for gaseous ethanol

$q = C_{sp} m \Delta T$

Use $q = C_{sp} m \Delta T$, to find $q_1 + q_2 + q_3$ = total heat