

Thermal equation of state and critical point 3.2.04-00



- What you can learn about ...
- Ideal gas
 - Real gas
 - Equation of state
 - Van der WAALS equation
 - BOYLE temperature
 - Critical point
 - Interaction potential
 - Molecule radius

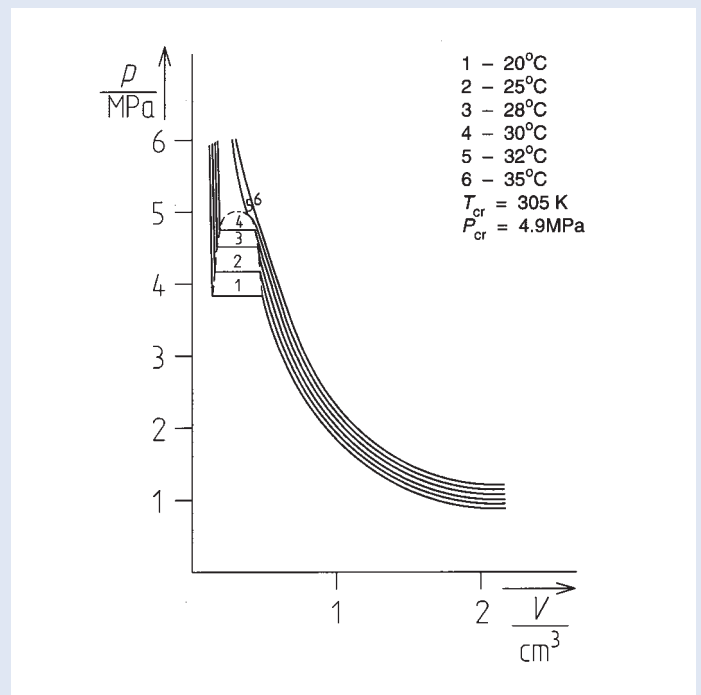
Principle:

A substance which is gaseous under normal conditions is enclosed in a variable volume and the variation of pressure with the volume is recorded at different temperatures. The critical point is determined graphically from a plot of the isotherms.

What you need:

Critical point apparatus	04364.10	1
Immersion thermostat TC10	08492.93	1
Accessory set for TC10	08492.01	1
Bath for thermostat, Makrolon	08487.02	1
Gasket for GL18, hole $d = 8$ mm, 10 pcs	41240.03	1
Vacuum pump, rotary sliding-vane, one-stage	02750.93	1
Adapter	02657.00	1
Safety bottle, 500 ml, 2 x GL18/8, 1 x 25/12	34170.88	1
Tripod base -PASS-	02002.55	1
Support rod, stainless steel 18/8, $l = 500$ mm	02032.00	1
Laboratory thermometers, -10...+100°C	38056.00	1
Universal clamp	37718.00	1
Right angle clamp	37697.00	1
Rubber tubing, $d = 8$ mm	39283.00	4
Rubber tubing, vacuum, i.d. = 8 mm	39288.00	1
Rubber tubing/vacuum, $d = 6$ mm	39286.00	1
Pinchcock, width 15 mm	43631.15	1
Hose clip, $d = 8-12$ mm	40996.01	4
Hose clip for 12-20 diameter tube	40995.00	2
Mercury tray	02085.00	1
Compressed gas, ethane, 14 g	41772.09	1

Complete Equipment Set, Manual on CD-ROM included
 Thermal equation of state and critical point P2320400



p-V-isotherms of ethane.

Tasks:

1. Measure a number of p-V-isotherms of ethane.
2. Determine the critical point and the critical quantities of ethane.
3. Calculate the constants of the Van der WAALS equation, the BOYLE-temperature, the radius of the molecules and the parameters of the interaction potential.