

4(a)(i)	temperature = $-273.15\text{ }^{\circ}\text{C}$
4(a)(ii)	temperature = 0 K
4(b)(i)	gas is ideal
4(b)(ii)	$pV = NkT$
	$N = 270 / (8.0 \times 10^{-21})$ $= 3.4 \times 10^{22}$
4(b)(iii)	$n = (3.4 \times 10^{22}) / (6.02 \times 10^{23})$ $= 0.056\text{ mol}$
4(c)	$\frac{1}{2} m \langle c^2 \rangle = (3 / 2) kT$
	$\frac{1}{2} \times m \times 1900^2 = 1.5 \times 8.0 \times 10^{-21}$
	$(m = 6.65 \times 10^{-27}\text{ kg})$
	$m = (6.65 \times 10^{-27}) / (1.66 \times 10^{-27})$ $= 4.0\text{ u}$