

- 4 (a) The equation of state for an ideal gas may be written as

$$pVA = NBT$$

where p is the pressure of the gas, V is the volume of the gas, A is the Avogadro constant, B is another constant and N is the number of molecules of the gas.

- (i) State the meaning, in the equation, of the symbol T .

..... [1]

- (ii) Identify the constant B .

..... [1]

- (b) The product pV for an ideal gas is also given by

$$pV = \frac{1}{3}Nm \langle c^2 \rangle.$$

- (i) State the meanings, in this equation, of the symbols m and $\langle c^2 \rangle$.

m :

$\langle c^2 \rangle$:

[2]

- (ii) Use the equations in (a) and (b) to derive an expression, in terms of A , B and T , for the mean kinetic energy E_K of a molecule of the gas.

$E_K =$ [2]