

radius of gyration, s

A parameter characterizing the size of a particle of any shape.

For a rigid particle consisting of mass elements of mass m_i , each located at a distance r_i from the centre of mass, the radius of gyration, s , is defined as the square root of the mass-average of r_i^2 for all the mass elements, i.e.

$$s = \left(\frac{\sum_i m_i r_i^2}{\sum_i m_i} \right)^{1/2}$$

For a non-rigid particle, an average over all conformations is considered, i.e.

$$\langle s^2 \rangle^{1/2} = \frac{\langle \sum_i m_i r_i^2 \rangle^{1/2}}{\left(\sum_i m_i \right)^{1/2}}$$

The subscript zero is used to indicate unperturbed dimensions, as in $\langle s^2 \rangle_0^{1/2}$.

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