

Spin-label NO-metry

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Spin-label NO-metry is defined as the use of nitroxide radical labels to monitor the nitric oxide (NO) diffusion-concentration product. Bimolecular collisions of NO with spin labels alter the electron paramagnetic resonance (EPR) spectral parameters of the spin label. Various experimental approaches can be used to observe those effects. Here we use the line-broadening EPR method. The Smoluchowski equation for the bimolecular collision rate of dissolved NO with spin labels yield the value for the diffusion coefficient of NO in water that is in agreement with the published value obtained by conventional methods. It follows that Heisenberg exchange between NO and nitroxide radical moiety occurs at an interaction distance of 4.5Å with probability close to one for each encounter. NO diffuses in the hydrocarbons more rapidly than predicted from the macroscopic viscosity. This work contributes to the foundation of spin-label NO-metric methodology.