Particulate mediators are not useful at very high field strengths, at very low concentrations, or in a poor match between angular frequency and dissipative time constant (and thus particle size, Eq. 19).

The introductory Eq. 1 treats the individual contributions as additive terms. This is valid only as long as the input energy is insignificantly changed along x. If there is both strong absorption due to electrolyte conductivity and particle mediation, the (local) magnetic energy density is given by:

$$ {}_xQ'_{H,M} = \tfrac{1}{2}\mu H_0^2 \exp(-2x/\delta_e)\exp(-x/\delta_a)\omega t. \qquad (24)$$

This last equation is thus more general than either Eq. 3 or Eq. 12.

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KINETIC AND TRANSIENT ELECTRIC DICHROISM STUDIES OF THE IREHDIAMINE-DNA COMPLEX

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We have used transient electric dichroism and temperature-jump relaxation kinetics to characterize the complex formed between irehdiamine A (preg-5-ene-3β-20α-diamine, IDA) and DNA from a variety of sources. Transient electric dichroism was used to monitor the change in DNA length and base tilt angle due to complex formation. A 5% length increase at saturation with IDA was observed for DNAs from *M. luteus* (70% G • C), *E. coli* (50% G • C), and *C. perfringens* (30% G • C), and also for poly dA • poly dT. The base ultraviolet transition moments in the complex are inclined at an average angle of about 60° to the helix axis. These properties are consistent with the β-kinked B-DNA structure proposed for the complex by Sobell et al. Two DNAs from eukaryotic sources (human placenta and calf thymus) showed a 13% length increase at saturation, whereas poly dG • poly dC showed no length increase. The base tilt angle in the complex was found to be independent of the DNA source.

Temperature-jump relaxation times for the DNA-IDA complex were generally faster than 1 ms, and showed a concentration dependence consistent with a simple bimolecular reaction mechanism. The measured forward reaction rate constants (10^7 – 10^8 $M^{-1}s^{-1}$) are too large to permit a mechanism in which IDA reacts with pre-existing kinks that occur transiently at a small fraction (less than 10^{-2}) of the DNA base pairs. The equilibrium constant calculated from the ratio of the forward and reverse binding rate constants agrees well with results obtained from equilibrium dialysis. Although the extent of hyperchromicity induced in DNA due to IDA binding is similar for DNAs from calf thymus and *M. luteus,* the activation energies and reaction enthalpies are clearly different. For example, the binding enthalpy change is 14 kcal mol^{-1} for *M. luteus* DNA, and only about 4 kcal mol^{-1} for calf thymus DNA.

Our observations are generally consistent with the β-kinked structure for the complex as proposed by Sobell et al., but differences, presumably sequence-dependent, must exist in the detailed mode of binding to DNAs from different sources.

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OPTICAL DETECTION OF COMPRESSIBILITY DISPERSION

Relaxation Kinetics of Glutamate Dehydrogenase Self-Association

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Pressure perturbation techniques of chemical relaxation exploit the augmented compressibility arising from the finite ΔV for the chemical process being observed. Compared to temperature jump, pressure jump suffers from a greatly decreased sensitivity of the chemical system to the perturbation. A sinusoidal pressure perturbation (traveling sound wave) allows phase-sensitive detection and time-averaging of the response ("stationary method" of Eigen and deMaeyer), thereby enhancing the signal-to-noise ratio. A finite relaxation time manifests itself as a phase shift of the response relative to the perturbation, and the signal can then be decomposed into the in-phase and quadrature components. The quadrature or imaginary part of the signal is directly proportional to $\omega\tau/\{1 + (\omega\tau)^2\}$, where ω is the angular frequency and τ is the relaxation time. Measuring the frequency dependence (dispersion) of the imaginary compressibility reveals a maximum at $\omega = 1/\tau$. Measurements of the real component at frequencies remote from the relaxation region (both above and below) permit the determination of ΔV for the process in question.