The molecular weight of *Artemia* ribosomes, as determined from their refractive index increment and light scattering intensity.

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Ribosomes fulfil essentially the same function in protein biosynthesis in all organisms. The ribosomal particles of *Escherichia coli* have been studied in great detail. Much less is known however about eukaryotic ribosomes; even data on their general physicochemical properties are scarce (5). Therefore we have determined a value for the molecular weight of the cytoplasmic ribosomes from the cryptobiotic, undeveloped embryos of the brine shrimp *Artemia sp.*

In all steps of the preparation (2,5) and during the measurements, the ribosome solutions contained 20 mM Hepes/KOH buffer (pH 7.5), 100 mM KCl, 9 mM Mg acetate, and 1 mM dithiothreitol. Their purity and homogeneity was checked by absorbance spectroscopy, electron microscopy, isopycnic centrifugation in CsCl gradients, photon correlation spectroscopy, and analytical boundary sedimentation.

Phosphorus determination and different colorimetric protein determinations have yielded that the ribosome solutions contain $(40.8 \pm 1)\mu g$ RNA and $(42 \pm 2)\mu g$ protein per A_{260}-unit. Thus a 1 mg/ml ribosome solution has an absorbance at 260 nm of 12.1 ± 0.4. This result has allowed the determination of concentrations in the following measurements.

The refractive index increments at infinite dilution and constant chemical potential of all diffusable components of the ribosome solutions were measured with a Rayleigh-Haber-Löwe interferometer : the values found at 546 and 436 nm are (0.168 ± 0.009) and (0.176 ± 0.009) ml/g. Comparison with published values for proteins, nucleoproteins and nucleic acids indicates that these results are very reasonable, and that measured or assumed values for ribosomes in other studies are too high.

Intensity measurements of scattered light were performed with a modified Malvern setup (1), using a laser (515.5 nm) as light source and a benzene sample as calibration standard, and with a Brice-Phoenix photometer model 5200 (Wood Mfg Co) which has been calibrated especially for molecular weight determinations of macromolecules in aqueous solution (4), using polarized and unpolarized light (436 and 546 nm). After taking into account intraparticle interference and depolarization, the data were plotted as a function of concentration; they agree all well and yield a molecular weight of $(3.4 \pm 0.2) \times 10^6$. A value of $(3.8 \pm 0.2) \times 10^6$ has been determined from the measured sedimentation and diffusion coefficient and density increment (3).

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