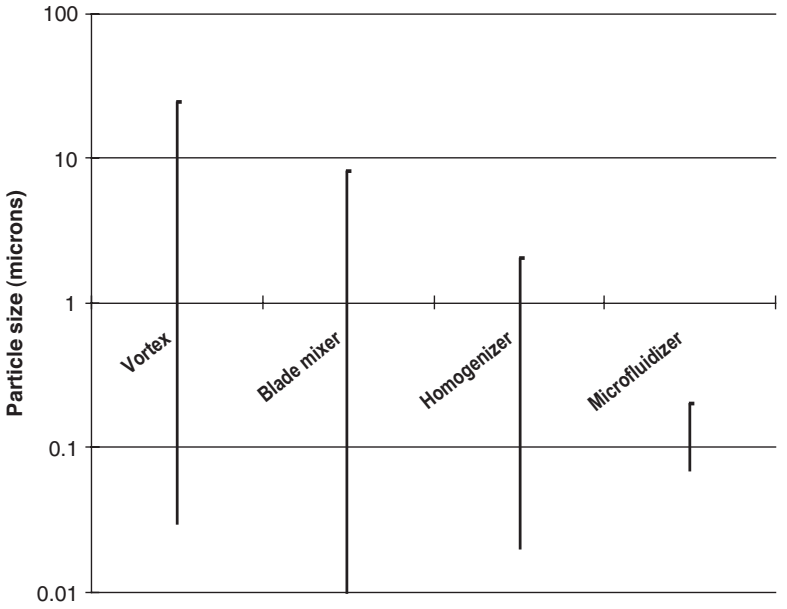

FIGURE 7.7 Emulsion particle size dependence on the method of manufacture.

and destructive interference. This intensity will therefore vary as the particles move, and the rate of variation will depend on the speed of the movement of the particles, which is in turn related to their size. This is why PCS is also known as "dynamic light scattering." The advantages of the use of PCS include the following:

- Direct measurement of particle size in the submicron range
- Particles are observed in situ in the fluid matrix
- Broad range: 1–5000 nm (5 microns)
- Reasonably fast

The disadvantages of the use of PCS include the following:

- Requires very dilute dispersions and careful sample preparation
- Low resolution: provides only limited detail of the distributions
- Expensive equipment
- Skill required to interpret results

A large variety of instruments are available for PCS (11).

Also useful are the measurements of zeta potential. Particles in suspensions typically acquire a surface charge by the adsorption of ions on the surface, dissolution of the material, chemical reaction, or preferential adsorption of a specific additive or impurity ions from the solution. Surface charge of colloidal particles can be inferred through the measurement of the zeta potential (the particle charge at the shear plane). The zeta potential is an important particle property that affects interparticle forces,