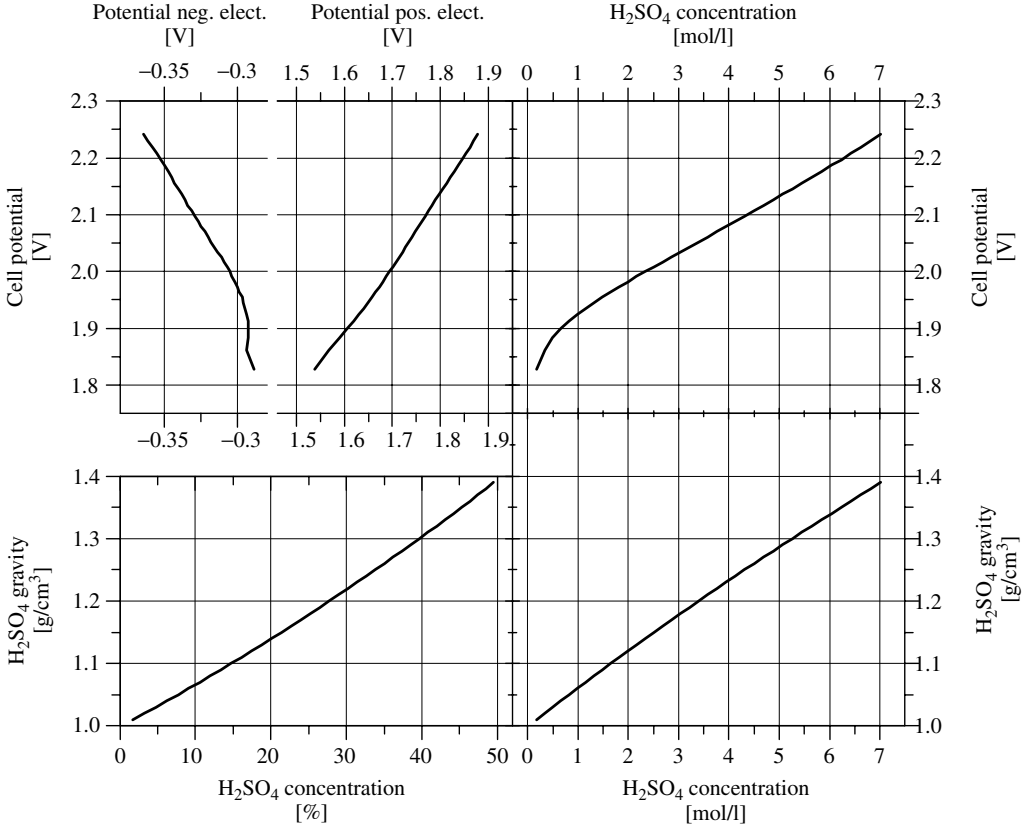

Figure 18.14 Correlation between the acid concentration in percent, mol/l or density and the equilibrium potential of the negative and positive electrodes and the cell potential. The graphs allow converting each value to the other

decreases more rapidly in sealed batteries during discharge than in flooded batteries. This must be taken into account, if the voltage is used as an SOC indicator.

Today, two different plate technologies are commonly used. The most common type of plate is the flat plate (Fauré type). The porous active mass is applied to the hard lead grid as a paste. The flat plate is simple and cheap to produce. The so-called tubular plates[10] are also widespread. A central lead rod, surrounded by active material, is inserted into a protective tube that is permeable to the electrolyte. A plate then consists of a row of adjacent tubes. While flat-plate electrodes have lower internal resistance and therefore higher specific power than tubular plates, the latter show more cycles in their lifetime. Manufacturing of tubular plates is more expensive than the manufacturing of flat plates. Figure 18.15 shows schematics of a flat-plate and a tubular-plate electrode. Currently, wounded lead cells come into the market consisting of a thin lead foil pasted with active material and with a very thin glass-mat separator between the electrodes. These batteries

[10] Tubular-plate electrodes are not very common in North America. Traditionally, tubular-plate batteries are more popular in Europe for cycling applications like, for example, fork-lift trucks.