

Fig. 1.—Relation of log A.D.C. to (concentration)^{1/2}. ●, 10% alcohol; ▲, 20% alcohol; ■, 30% alcohol.

constant of a solvent(s) system is only one factor, among many, that account for solubility.

The relationship of the apparent pK_a values (their Fig. 7) for secobarbital and the A.D.C. of the solvent blend was also examined (apparent pK_a was plotted *vs.* log A.D.C.). Figure 2 shows that the glycerin solvent blends were the only blends to exhibit a linear relationship. Alcohol and propylene glycol show linear portions but with positive deviations at low levels of the respective semipolar solvent. The distinctly different behavior of the PEG 400 blends is evident.

The mechanism of dissolution in aqueous blends of alcohol, propylene glycol, and glycerin may be the same (possibly solute-solvent interaction)

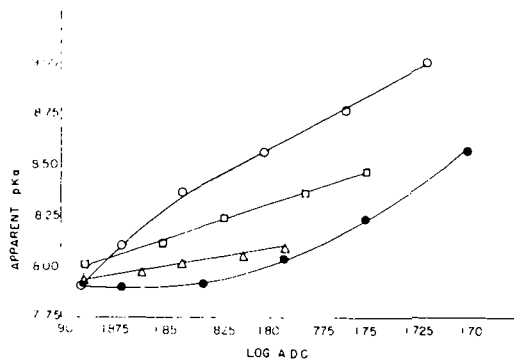


Fig. 2.—Effect of A.D.C. on pK_a of secobarbital. ○, Alcohol; □, propylene glycol; △, glycerin; ●, PEG 400.

TABLE I.—PREDICTED SOLUBILITIES OF SECOBARBITAL

% Alcohol	% Glycerin	% Water ^a	√C	Concentration of Secobarbital, %
10	40.0	50.0	0.94	0.88
20	25.5 ^a	54.5	1.10	1.21
30	10.0	60.0	1.30	1.70

^a Estimated.

differing only in degree. The adverse effect (i.e., lowering solubility) of water on the solvent power of the "good" solvents could be due to water competing with the solute for intermolecular H-bonding with the "good" solvent rather than a polarizing (i.e., dielectric) effect.

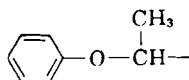
Additional experimental work such as examining the binary systems of glycerin with the other glycols and alcohol and conductance measurements of the entire series would provide further information, particularly since PEG 400 has, relatively, such a depressant effect on the ionization of secobarbital at concentrations above 40%.

REFERENCES

- (1) Autian, J., and Udani, J. H., *THIS JOURNAL*, **49**, 376(1960).
- (2) Moore, W. E., *ibid.*, **47**, 855(1958).

ERRATUM

In the review article titled "Antibiotics. 1956-1961" (1), the structure for phenoxymethyl penicillin (phenethicillin) on page 20 should be



(1) Pratt, R., *THIS JOURNAL*, **51**, 1(1962).