

THE STABILITY OF PENICILLIN IN AQUEOUS SOLUTION

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In a previous publication (Benedict, Schmidt, Coghill, and Oleson, 1945), data were presented in table 1 (p. 93) which purported to be the half-lives of penicillin at various temperatures and acidities. These values were read from experimental curves and were inadvertently taken where the curves crossed the

TABLE 1
The effect of pH and temperature on the half-life of pure sodium penicillin G
(Time in hours to inactivate 50 per cent)

pH	0 C	10 C	24 C	37 C
2.0	4.25	1.30	0.31	
3.0	24	7.6	1.7	
4.0	197	52	12	
5.0	2,000*	341	92	
5.5				62
5.8			315	99
6.0			336	103
6.5			281	94
7.0			218	84
7.5			178	60
8.0			125	27.6
9.0			31.2	
10.0			9.3	
11.0			1.7	

* Estimated.

50-unit levels. Inasmuch as all experiments did not begin at the 100-unit level, the values given in the table do not represent the true half-lives. The correct values are given above in table 1.

When the corrected values are applied to the stability curves in figure 10 (p. 93), the peak of the 24 C curve will be slightly less (336 hours instead of 356) and that of the 37 C curve slightly higher (103.2 hours instead of 99).

At the time of the previous publication, it was not permissible to refer to the multiplicity of penicillins. It can now be stated, however, that the data referred to above were obtained with pure sodium penicillin G. Since that time it has been possible to obtain some of the corresponding data on three crystalline sodium penicillins, F, K, and X. Figure 1 indicates the comparative stabilities

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of these pure compounds at pH 2.0 and a temperature of 24 C. It is apparent that under these conditions, penicillin K is only about half as stable as penicillin G, the others lying midway between them. The half-lives are 7, 11, 11, and

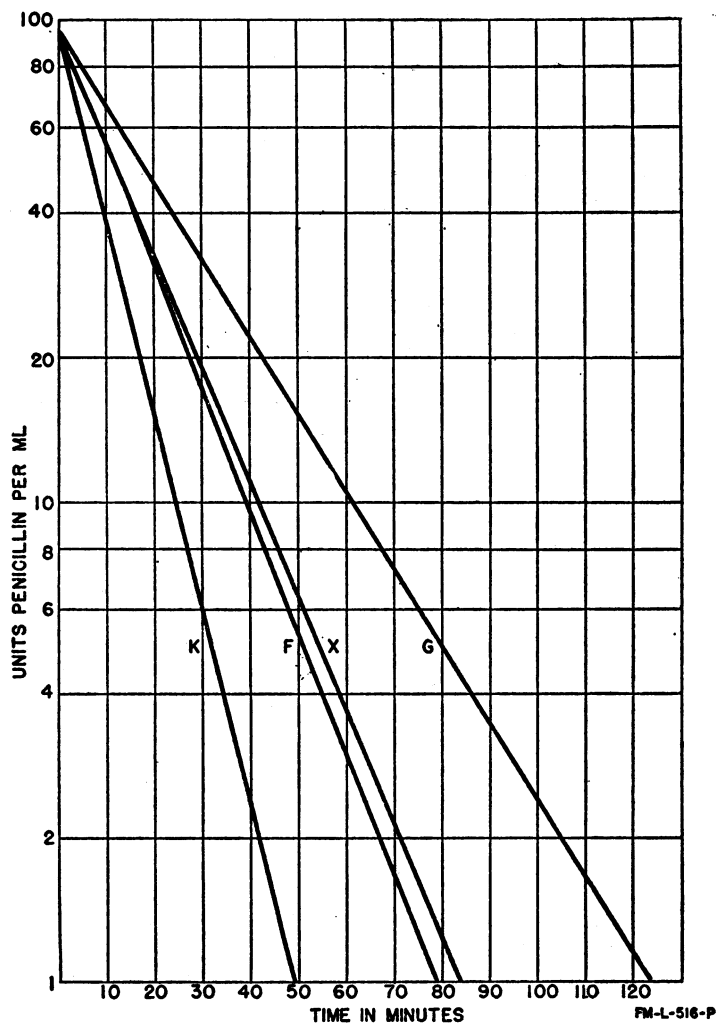


FIG. 1. STABILITY OF VARIOUS PENICILLINS AT PH 2.0 AND 24 C

18.5 minutes for penicillins K, F, X, and G, respectively. This is obviously of importance in connection with commercial recovery operations.

REFERENCE

- BENEDICT, R. G., SCHMIDT, W. H., COGHILL, R. D., AND OLESON, A. P. 1945 Penicillin. III. The stability of penicillin in aqueous solution. *J. Bact.*, **49**, 85-95.