ml of CF_3COOH and stirred at 0° for 3 hr. The CF_3COOH was removed *in vacuo* to yield a yellow oil which was then dissolved in slightly basic aq soln. The aq phase was extd several times with $CHCl_3$ to remove any unreacted starting material. The aq soln was made slightly acidic and the org acid which pptd was removed by filtration and dried to give 0.90 g (81% yield) of white solid. Recrystn from PhH–Me_2CO gave 0.86 g of product; mp 180.0–180.5°. *Anal.* ($C_{19}H_8N_8O_4$) H, N; Calcd C, 67.45; found, 68.08.

Acknowledgment.—The authors wish to thank Dr. H. S. Ragheb of the Department of Biochemistry, Purdue University for performing biological testing of **1a,b,c,d**.

Synthetic Biologically Active Polymers. 7. Antibacterial Activity of Some Sulfonamide–Formaldehyde Copolymers

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Received September 10, 1970.

Chemistry.—In previous publications[2] we have described the preparation and certain biological activities of a number of synthetic biologically active polymers. Activities dealing with antimalarial properties of some sulfonamide–formaldehyde copolymers were among these reports.[2c-e] Since these latter reports, we have begun to screen the same or analogous copolymers more broadly. This report concerns the antibacterial activity of three sulfonamide–formaldehyde copolymers (see Table I) and a sulfone–formaldehyde copolymer. The copolymers were prepared by methods reported earlier.[2c-e]

Biological Activity.—As can be seen from Table I, in most tests, the monomer and the polymer had approximately equivalent antibacterial activity under the test conditions employed with a general tendency for the monomer activity to be higher. Thus, it continues to appear that polymerization of drugs may be useful as a method to prepare novel drug systems.

Employing three samples of the 4,4′-diaminodiphenylsulfone–formaldehyde copolymer of differing molecular weights[2e] in the antibacterial testing gave results (see Table I) which indicated that in this copolymer system, only a very minor indication of variation of activity with molecular weight was observed.

Experimental Section

All formaldehyde copolymers were prepared and characterized as reported earlier.[2c-e]

Antibacterial screening was carried out by seeding Mueller–Hinton agar with the test organisms and adding antibiotic assay cylinders to each petri dish. Each compound tested was added to the cylinders as a 1% solution in DMF. Each monomeric sulfonamide drug and the corresponding formaldehyde copolymer were tested at the same time. After overnight incubation at 37°, the zones of inhibition were measured. They were generally of the order of magnitude of 20–30 mm, even though the total lowest value observed was 10 mm and the highest 35 mm.

TABLE I

RELATIVE ANTIBACTERIAL ACTIVITY OF SOME SULFONAMIDE DRUGS (M) AND THE FORMALDEHYDE COPOLYMERS (P) THEREOF

Sulfonamide system	Test organism	Relative activity M	P	
Sulfapyridine	*Staphylococcus pyogenes*	1.1	1.0	
	Escherichia coli	1.7	1.0	
	Aerobacter aerogenes	1.1	1.0	
	Pseudomonas aeruginosa	1.1	1.0	
Sulfabenzamide	*Staph. pyogenes*	1.5	1.0	
	E. coli	1.0	1.0	
	A. aerogenes	1.4	1.0	
Sulfanilamide	*Staph. pyogenes*	1.2	1.0	
	E. coli	1.2	1.0	
	A. aerogenes	1.1	1.0	
	Ps. aeruginosa	1.8	1.0	
4,4′-Diaminodiphenylsulfone	*Staph. pyogenes*	1.4	1.0	($\bar{m}_w$ = 4700)[a]
		1.7	1.0	($\bar{m}_w$ = 7600)
		1.3	1.0	($\bar{m}_w$ = 10,000)

[a] $\bar{m}_w$ = weight average molecular weight ± 10%.[2e]

Acknowledgments.—We are indebted to the Public Health Service for support of this work under Research Grant 5RO1-AI06662, and to Ayerst Laboratories for carrying out the antibacterial testing.

New Thiocarboxamides Derivatives with Specific Gastric Antisecretory Properties

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Received July 11, 1970

Atropine-like drugs with their troublesome systemic side effects were, for a long time, the only products available for gastric antisecretory properties in ulcer therapy. During the past few years attempts have been made to find specific gastric antisecretory products acting by a nonanticholinergic pathway.

A well-documented review has just been published on this subject.[1] Among newly described chemicals, the most studied, 2-phenyl-2-(2-pyridyl)thioacetamide (PPT),[2] although not possessing really specific antigastrin properties,[3] seems to be the most available. Surprisingly, very few derivatives of this structure have been described. In the course of a research program on antiulcer compounds, we therefore synthesized some thiocarboxamides. Although completely devoid of anticholinergic activity, most of these compounds pos-

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