

cases, a higher current density range has been found to operate. These baths, therefore, appear to be promising substitutes for the cyanide bath used in the electro-plating industry.

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N⁴-(BIGUANIDYL-SUBSTITUTED)-N¹-BENZOYL SULPHANILAMIDES

CONSIDERING the interesting results in malarial chemotherapy, which have been noticed by Bami, Iyer and Guha¹ working in the field of N⁴-substituted sulpha-biguanides, it was thought worthwhile to extend this field to include the highly active N¹-sulphanilyl-benzamide in view of the observation made by Sen Gupta,² *et al.* and Bose and Ghosh³ that N¹-benzoylsulphanilamide possesses high antibacterial activity against certain strepto- and staphylo-infections *in vitro*, besides possessing high chemotherapeutic activity against Flexner organism and a very low toxicity. Bami, *et al.* have reported that some of the sulpha-biguanides possess suppressive antimalarial activity "when tested at relatively large doses" though not coming upto the standard of either paludrine or quinine.⁴

It was, therefore, considered desirable to study the influence of a substituted biguanide molecule attached to the N⁴-position of N¹-benzoyl-sulphanilamide.

Some N⁴-substituted biguanidyl-N¹-benzoyl-sulphanilamides of type (I) have now been synthesised for studying their effect against malarial and certain coccal infections.

$RNH-C(=NH)-NH-C(=NH)-NH-C_6H_4-SO_2NHCO.C_6H_5$ (where R=H —, substituted
Type I aryl-etc.)

The compounds have been prepared by refluxing N¹-sulphanilyl-benzamide hydrochloride with the appropriate cyanoguanidines in pyridine medium (ethanol unsuccessful) for 3-8 hours. All the sulpha-biguanides have been isolated and characterised as white powdery hydro-

chlorides, some being crystallisable from organic solvents; others being uncrystallisable could only be purified by removing the starting materials with suitable solvents. The compounds are amphoteric in nature. All the sulpha-biguanides (*vide* Table) excepting compound No. 4, get decomposed while melting.

No.	R in compounds Type I	M.P., °C.
1	H-	240-41
2	C ₆ H ₅ -	264
3	<i>p</i> -Cl-C ₆ H ₄ -	215-16
4	<i>m</i> -Cl-C ₆ H ₄ -	239
5	<i>p</i> -Br-C ₆ H ₄ -	266-68
6	<i>p</i> -I-C ₆ H ₄ -	230-32
7	<i>p</i> -CH ₃ O-C ₆ H ₄ -	213-14
8	<i>p</i> -CH ₃ -C ₆ H ₄ -	225-26

Full details will be published elsewhere.

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THE NUCLEAR OXIDATION OF COUMARINS

In the course of the investigation requiring intermediates for the fluorescent azo dyes, we undertook the systematic oxidation of certain coumarin derivatives by the alkaline potassium persulphate method of Elbs.¹ This method has been used by Bargellini and Monti² to oxidise two coumarins, and by Seshadri and co-workers³ to oxidise the flavones. As the hydroxy-coumarins failed to give any definite crystalline products, we have used their methyl ethers in pyridine solution and obtained definite results with the following coumarin derivatives.

(1) Coumarin, (2) 7-methoxy-4-methylcoumarin, (3) 5-methoxy-4:7-dimethylcoumarin, (4) 5:7-dimethoxy-4-methylcoumarin, (5) 6:7-dimethoxy-4-methylcoumarin, (6)