SYNOPSIS

PART I. STUDIES IN FRIDEL-CRAFTS REACTIONS

Section A: The condensation of phenylisocyanate and phenylisothiocyanate with hydrocarbons and phenolic compounds.

Benzene, naphthalene and anthracene have been condensed with phenylisocyanate in presence of anhydrous aluminium chloride to give the anilides of benzoic, naphthoic and anthroic acids. Similarly phenylisothiocyanate gave the anilides of thiobenzoic, thionaphthoic and thioanthracic acids. The condensation of naphthalene and anthracene gave isomeric compounds which have been separated and identified.

The condensation of phenylisocyanate with phenol, resorcinol and resacetophenone gave the aryl esters of phenylurethanes, the condensation taking place with the hydroxyl group. However, with phenylisothiocyanate, the nuclear condensation took place. Resacetophenone 7-hydroxy-4-methylcoumarin and orcinol gave evidence of $\beta$ and $\gamma$ substitution. However, phenylisocyanate underwent nuclear condensation with the methyl ethers of phenols.

Section B: The condensation of phenylisocyanate and phenylisothiocyanate with aminoanthraquinones in presence of anhydrous aluminium chloride in nitrobenzene.

The condensation of phenylisocyanate with 1-aminoanthraquinone in presence of anhydrous aluminium chloride gave 1-phenyl-carbamidoanthraquinone, which was a good vat dyestuff. Similar products were obtained from 2-aminoanthraquinone, 1:4-diaminoanthraquinone, 1:5 diaminoanthraquinone and 2:6 diaminoanthraquinones. Phenylisothiocyanate was condensed under similar conditions with these aminoanthraquinones, and the
properties of the resulting vat dyestuffs were studied.

Section C: The condensation of anthraquinone and nitrobenzene in presence of anhydrous aluminium chloride.

On heating a mixture of anthraquinone with anhydrous aluminium chloride in nitrobenzene solution, a gray dyestuff which proved to be a mixture of three vat dyestuffs by ascending as well as circular paper chromatography, was produced. The mixture was separated and each component was examined for its constitution. Each dyestuff contained a good proportion of nitrogen and chlorine. A similar type of condensation took place with 2-methyl-anthraquinone, 2-chloroanthraquinone and benzanthrone.

PART II. SECTION A: CONDENSATION OF PHENYLISOCYANATE WITH DISODIUM 4:4'-DIAMINO-STILBENE-2:2' DISULPHONATE

One molecule of phenylisocyanate was condensed under specific conditions with one molecule of Disodium 4:4'-diamino-stilbene-2:2' disulphonate, and the resulting product (I) was condensed with one molecule of cyanuric chloride at 0°C. The other two chlorine atoms of cyanuric chloride were condensed with various amines and substituted amines. One molecule of cyanuric chloride was also condensed with two and three moles of (I). The resulting products possessed the properties of fluorescent brightening agents. Their absorption in the ultraviolet region was studied.

PART II. SECTION B: REFRACOR - A NEW PHYSICAL CONSTANT OF ORGANIC LIQUIDS.

A new physical constant called the Refractor ($P_R$) is obtained by