A THESIS
ENTITLED

A STUDY ON CHROMONES

Presented By

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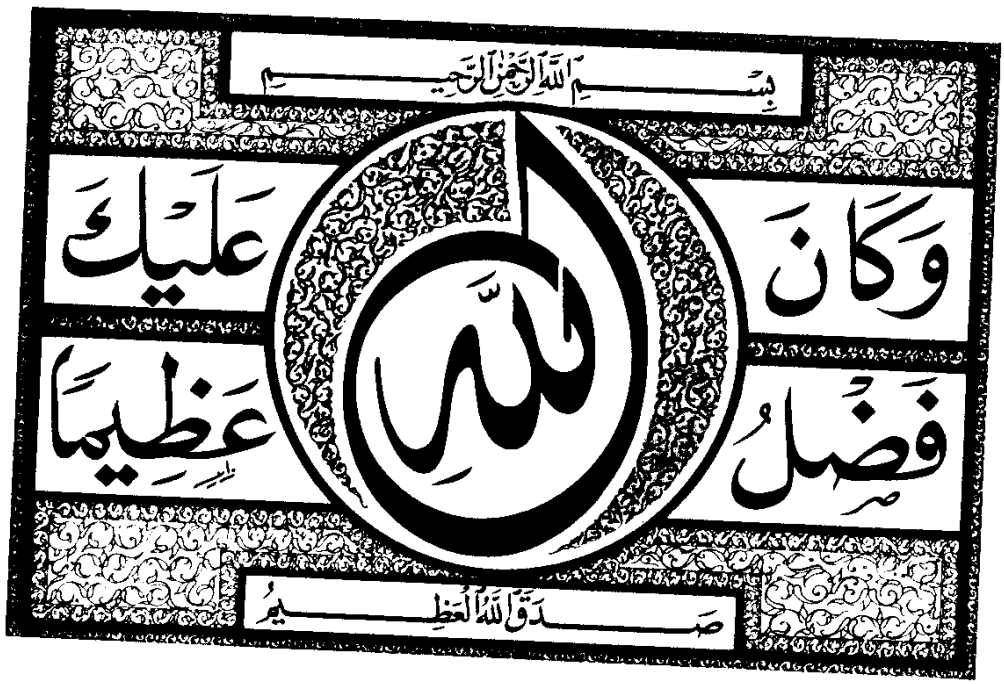

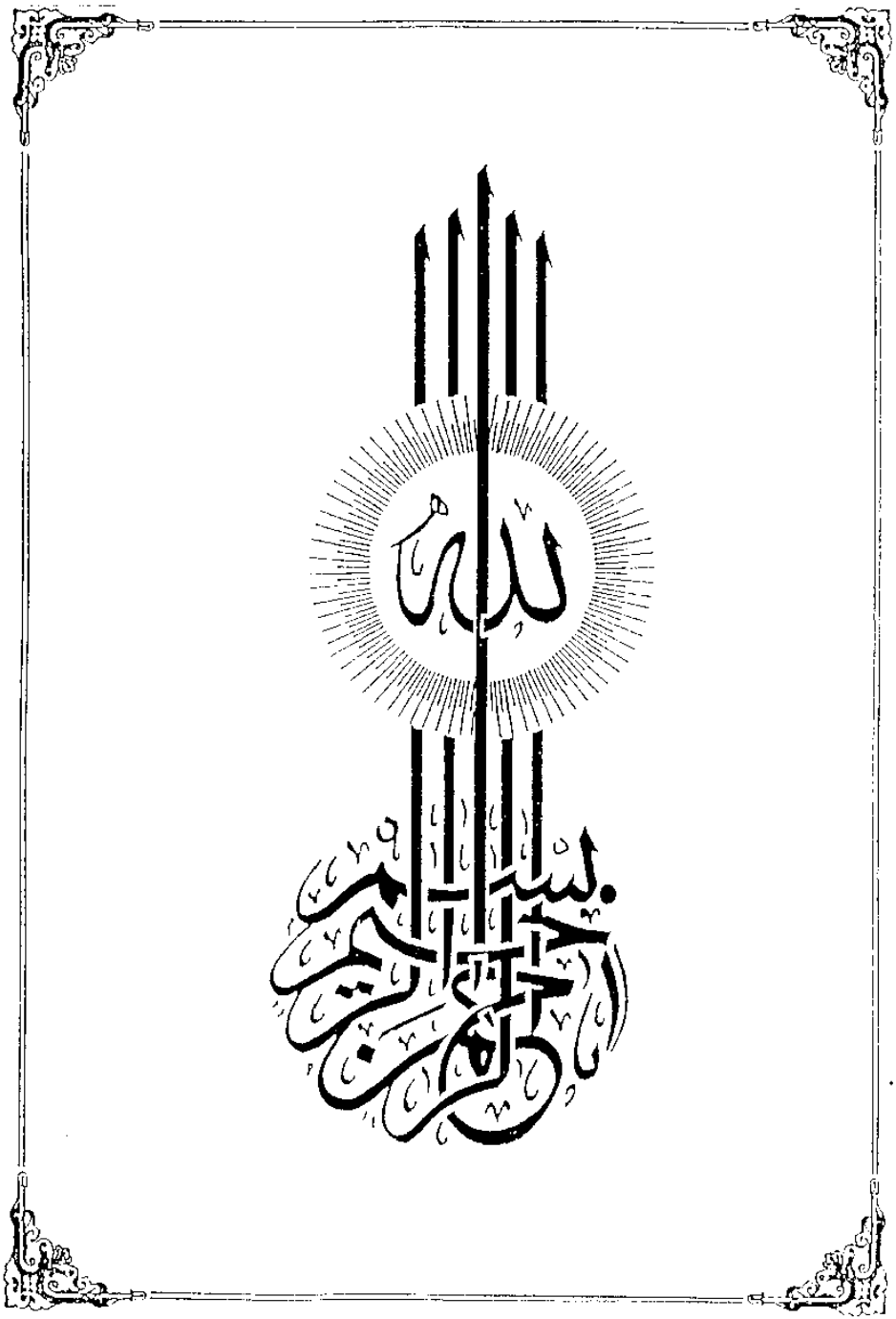

TO THE MEMORY OF
MY FATHER

TO MY WIFE

AND
TO MY DAUGHTER NOURAN

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SUMMARY OF THE ORIGINAL WORK

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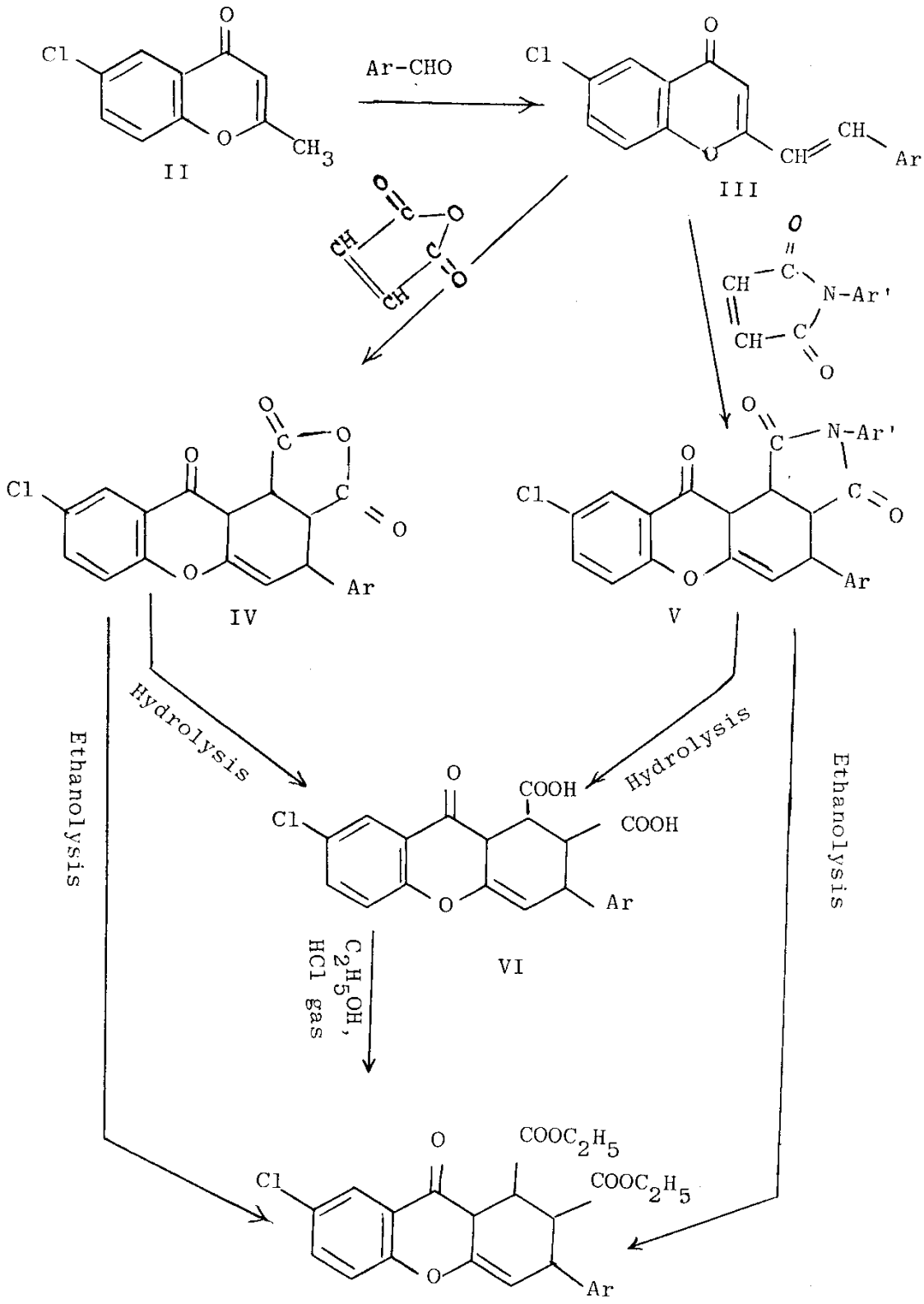
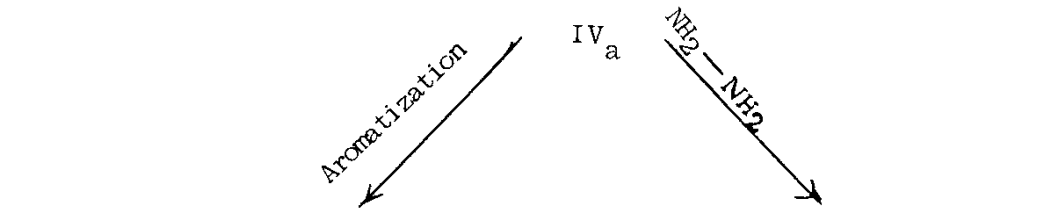
It has well been known that 4H-1-benzopyran-4-one derivatives (chromones) have pronounced biological activity.

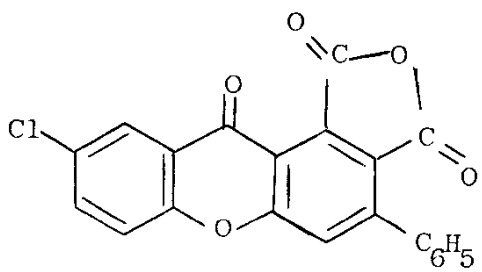
In our present work we aim to synthesise some new chromones in the hope of obtaining some biological activity for these synthesised new compounds.

6-Chloro-2-methyl-4H-1-benzopyran-4-one(II) condensed with aromatic aldehydes to yield the 2-stryl derivatives (III_{a-f}) which acted as dienes with maleic anhydride and N-arylmaleimides and gave the xanthone derivatives (IV_{a-d}) and (V_{a-t}) as Diels-Alder adducts. Hydrolysis and ethanolysis of both IV_a and V_a were carried out to give the dicarboxylic acid (VI) and the diester (VII) respectively.

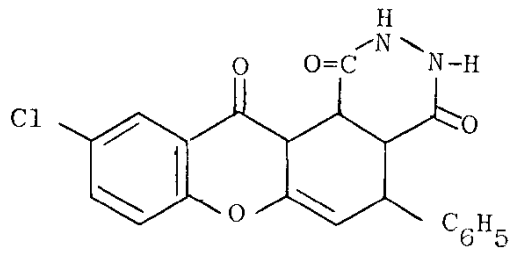


Aromatization of IV_a gave phthalic anhydride derivative (VIII). IV_a reacted with hydrazine hydrate to form the phthalazin 1,4-dione derivative IX. Compounds $X_{a,b}$ were obtained via photocyclodehydrogenation of $III_{a,b}$. The vicinal dibromides (XI_{a-d}) reacted with thiourea or urea to give XII_{a-d}.

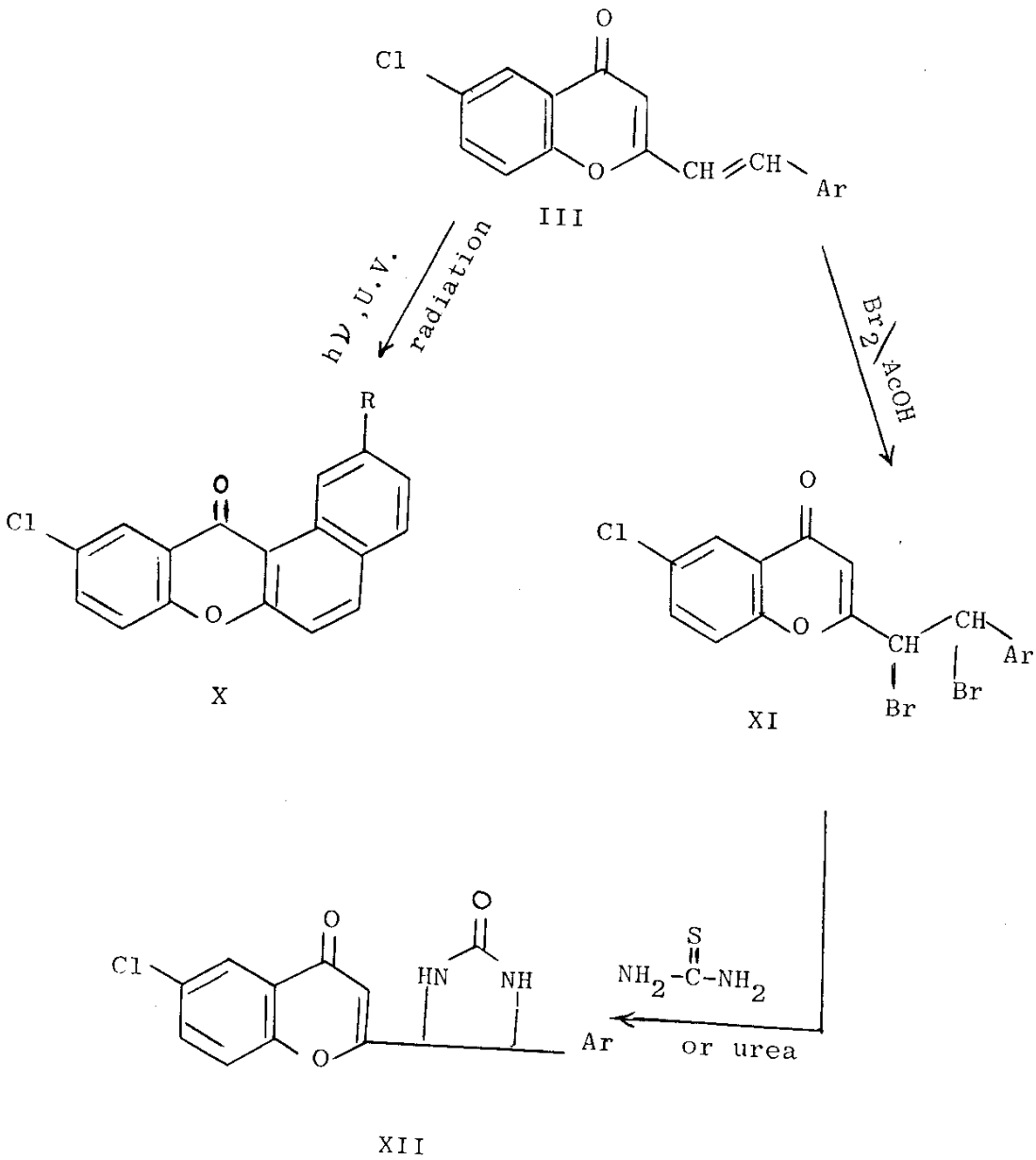




VIII

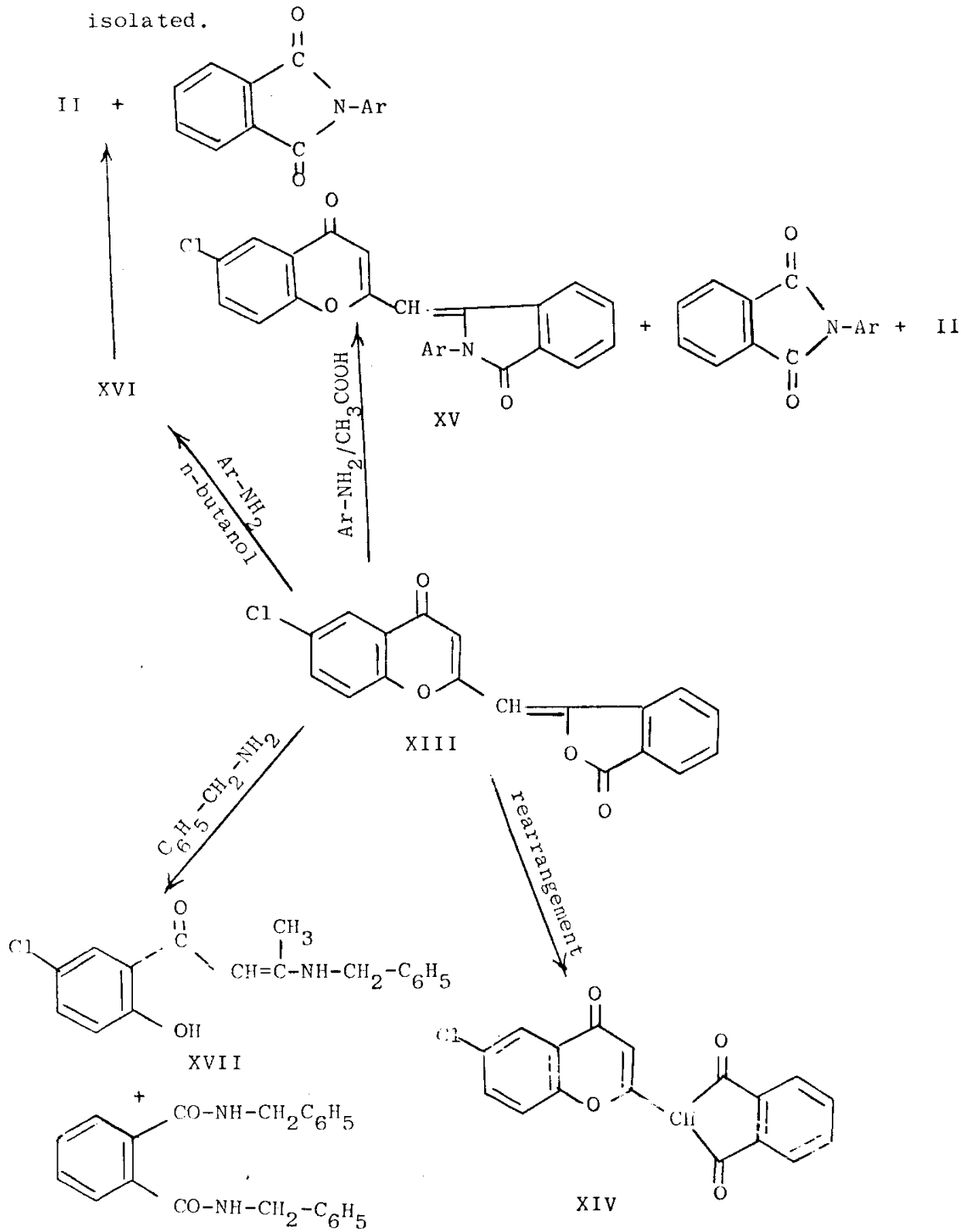


IX

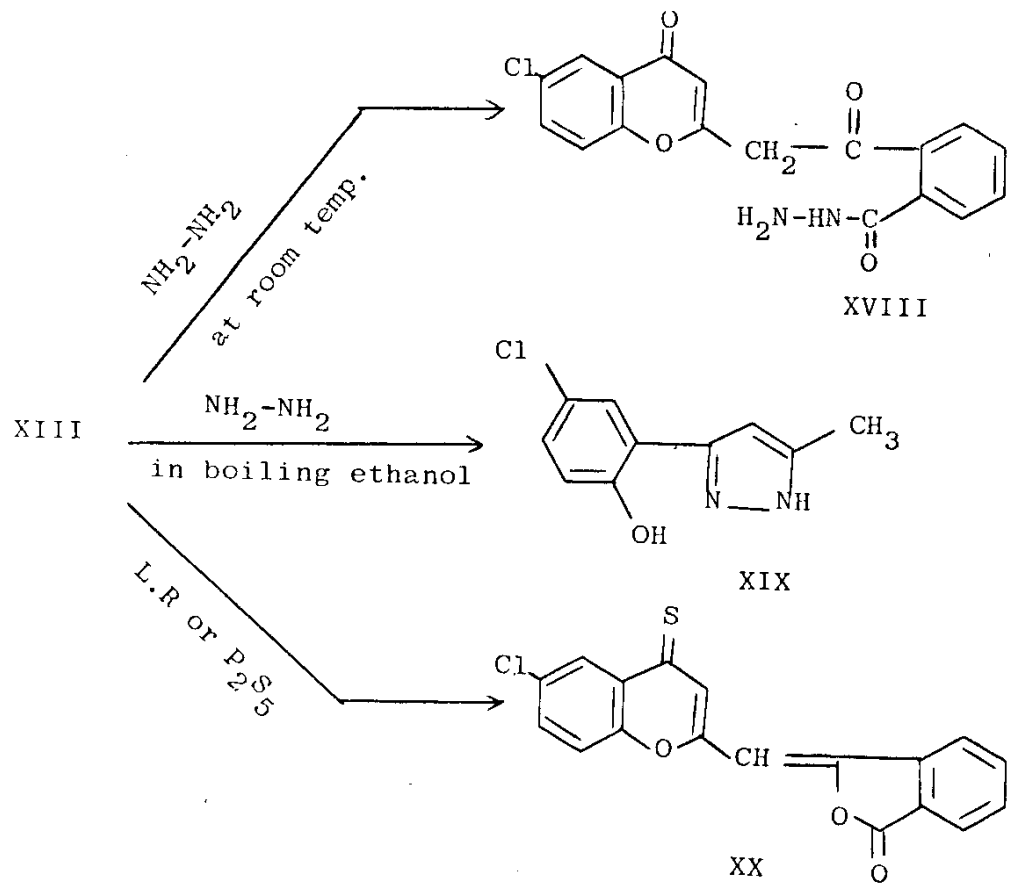


The chromone (II) reacted with phthalic anhydride to yield the corresponding phthalide (XIII) which easily isomerized into 2-substituted-1,3-indandione (XIV). The reaction of phthalide (XIII) with amines was found to depend on both the conditions of the reaction and the nature of amine, in boiling acetic acid phthalimidines (XV_{a-c}) and N-aryl-

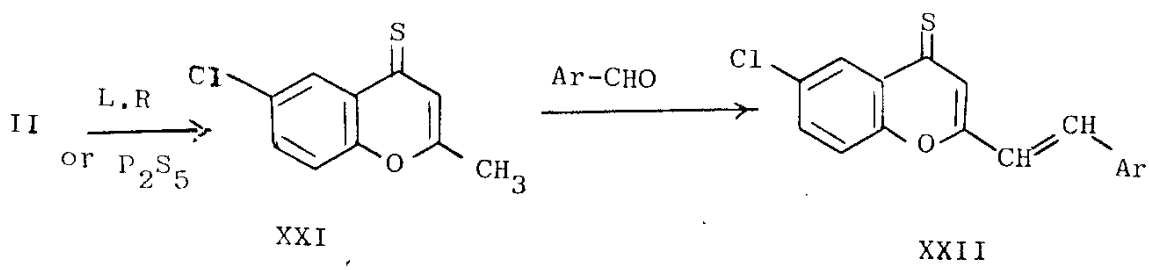
phthalimides were obtained beside the starting chromone(II), while in n-butanol the products were N-arylphthalimides and II via the intermediate XVI. In case of benzylamine in ethanol N,N-dibenzylphthalamide together with XVII were isolated.



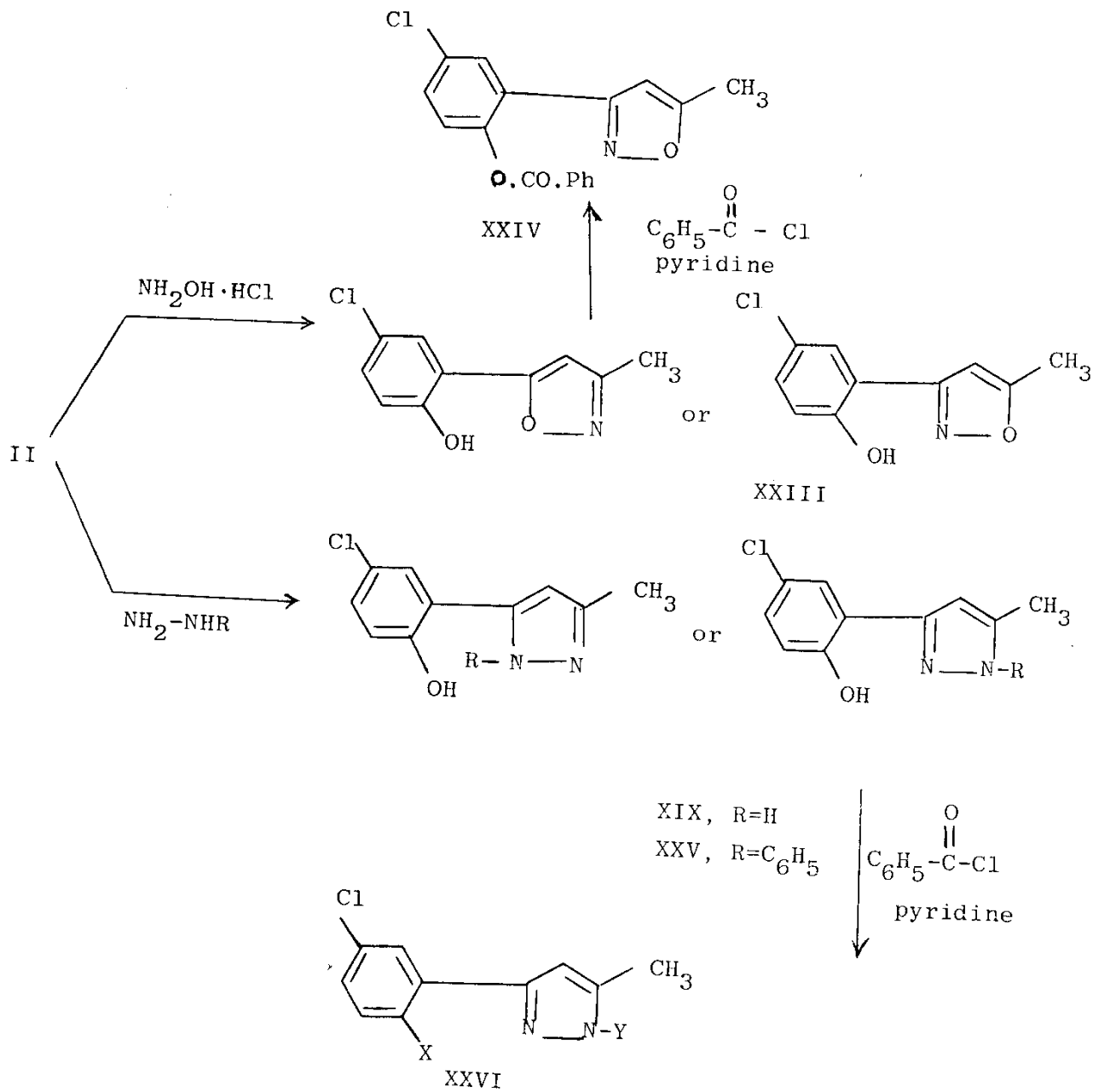
Hydrazine hydrate reacted with XIII in ethanol to give XVIII or XIX according to reaction conditions. Thiation of XIII by Lawesson's Reagent led to the formation of XX.



The chromone (II) was thiated by Lawesson's Reagent to give XXI which condensed with aromatic aldehydes giving $XXII_{a-d}$.



Excessive hydroxylamine hydrochloride and hydrazines reacted with II to give isoxazole derivative (XXIII) and pyrazoles XIX and XXV which were benzoylated yielding isoxazole monobenzoyl derivative XXIV and pyrazole mono and/or dibenzoyl derivatives $XXVI_{a,b}$ respectively according to the condition of the reaction.



a) X=OH ; Y = $CO-C_6H_5$ b) $X=O.CO-C_6H_5$, $Y=COC_6H_5$