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# ADDITION OF THE Cα-H IMINES BOND TO ACRYLONITRILE AND METHACRYLONITRILE

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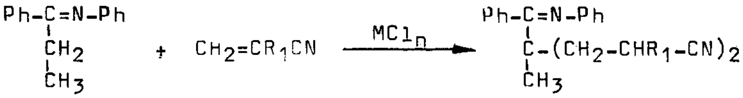
It has recently been indicated that the H atom α relative to a C=N group in ketimines can be added to the C≡N triple bond of saturated nitriles in the presence of $AlCl_3$ as catalyst, obtaining, according to the reaction conditions, 1,3-diimines, or substituted pyrimidines$^{(1,2)}$.

In the reaction of these ketimines (I) with acrylonitrile and methacrylonitrile at room temperature, the cyanoethylation compounds are obtained through a Michael condensation$^{(3)}$, using as catalysts different Lewis acids.



$$\begin{array}{l}Ph\text{-}C{=}N\text{-}Ph\\ \quad |\\ \quad CH_2\\ \quad |\\ \quad CH_3\end{array} + CH_2{=}CR_1CN \xrightarrow{MCl_n} \begin{array}{l}Ph\text{-}C{=}N\text{-}Ph\\ \quad |\\ \quad C\text{-}(CH_2\text{-}CHR_1\text{-}CN)_2\\ \quad |\\ \quad CH_3\end{array}$$

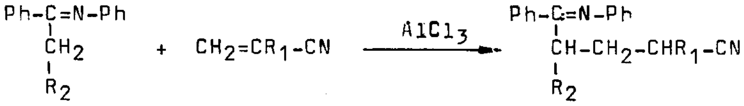
(I) (II)

($MCl_n$ = $SnCl_4$, $FeCl_3$, $ZnCl_2$)

($R_1$ =H, $CH_3$)

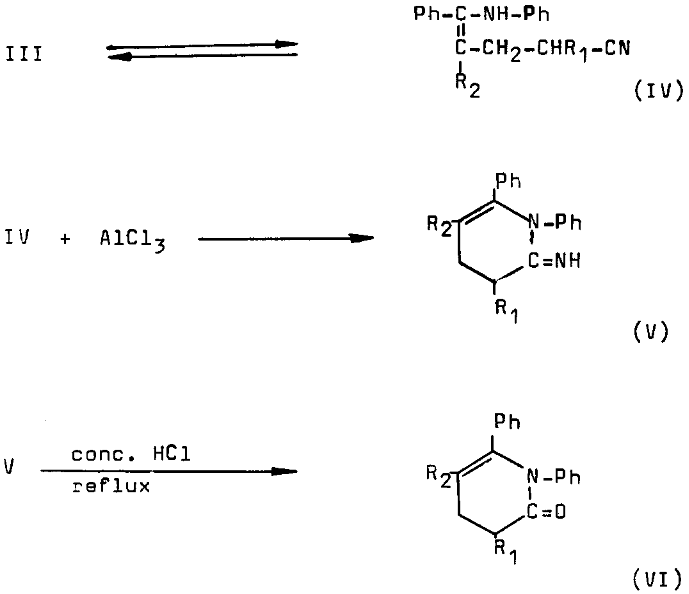
When the catalyst used is $AlCl_3$, and under the same reaction conditions, cyclic non saturated amidines (V) are mainly obtained, as well as the cyanoethylation compound (II), which by further hydrolysis with refluxing concentrated HCl leads to the corresponding substituted dihydropyridones (VI).

The reaction of the formation of these amidines proceeds through the enamine (IV) originated by tautomerism of the monocyanoethylation compound (III).



$$\begin{array}{l}Ph\text{-}C{=}N\text{-}Ph\\ \quad |\\ \quad CH_2\\ \quad |\\ \quad R_2\end{array} + CH_2{=}CR_1\text{-}CN \xrightarrow{AlCl_3} \begin{array}{l}Ph\text{-}C{=}N\text{-}Ph\\ \quad |\\ \quad CH\text{-}CH_2\text{-}CHR_1\text{-}CN\\ \quad |\\ \quad R_2\end{array}$$

(III)



(IV)

(V)

(VI)

($R_1$=H,$CH_3$)

($R_2$=H,$CH_3$)

The elemental analyses, molecular weight, and also IR, and NMR spectra, agree in all cases with the structures indicated.

## BIBLIOGRAPHY

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