

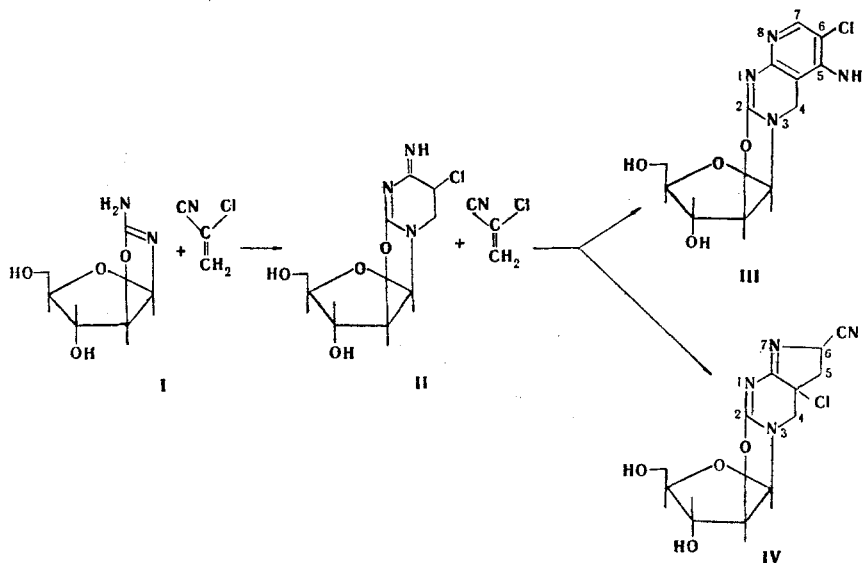
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When we refluxed 2-amino- $\beta$ -D-arabinofurano[1',2':4,5]oxazoline (I) with  $\alpha$ -chloroacrylonitrile in a ratio of 1:1 or 1:2 in alcohol, we unexpectedly found that the reaction does not stop with the formation of 2,2'-anhydro-1-( $\beta$ -D-arabinofuranosyl)-5-chloro-5,6-dihydrocytosine (II); a second molecule of  $\alpha$ -chloroacrylonitrile immediately undergoes reaction, and this is followed by splitting out of hydrogen chloride and the formation of 6-chloro-5-amino-2,2'-anhydro-3-( $\beta$ -D-arabinofuranosyl)-3,4-dihydropyrido[2,3-d]pyrimidine (III) and 4a-chloro-6-cyano-2,2'-anhydro-3-( $\beta$ -D-arabinofuranosyl)-3,3,4a,5-tetrahydro-6H-pyrrolo[2,3-d]pyrimidine (IV) in 35% overall yield.

Compounds III and IV were separated by successive crystallization from n-propyl alcohol and 90% ethanol. Compound IV was obtained in 6% yield and had mp 178-179°C (ethanol) and  $\alpha_D^{20} -42.4^\circ$  (c 0.25, dimethylformamide). Compound III was obtained in 17% yield and had mp 238°C (dec., ethanol),  $\alpha_D^{20} -305.2^\circ$  (c 0.25, dimethylformamide), and a molecular weight of 312 (by mass spectrometry).

A singlet of an NH<sub>2</sub> group at 5.85 ppm, a singlet of a pyridine ring CH group at 7.22 ppm, and a singlet of a CH<sub>2</sub> group of an unsaturated pyrimidine ring at 4.45 ppm are observed in the PMR spectrum (d<sub>6</sub>-DMSO) of III. In the case of IV, the signal of the protons attached to C<sub>4</sub> appears at 4.02 and 3.76 ppm in the form of a characteristic AB quartet (<sup>2</sup>J = 13 Hz). The 5-CH<sub>2</sub> group is displayed in the form of a multiplet at 2.5-2.9 ppm. The signal of the



proton attached to C<sub>6</sub> at 5.00 ppm is observed in the form of a double doublet (<sup>3</sup>J = 1.5 and 5.2 Hz).

A characteristic band at 2250 cm<sup>-1</sup> (C≡N) is observed in the IR spectrum of a mineral oil suspension of IV. UV spectrum (water),  $\lambda_{\max}(\epsilon)$ : 332 (8620) (III) and 250 nm (12000) (IV).

Found for III: C 46.0; H 4.2; Cl 11.9; N 18.3%. C<sub>12</sub>H<sub>13</sub>ClN<sub>4</sub>O<sub>4</sub>. Calculated: C 46.1; H 4.2; Cl 11.3; N 18.3%. Found for IV: C 45.7; H 4.2; Cl 11.4; N 18.2%. C<sub>12</sub>H<sub>13</sub>ClN<sub>4</sub>O<sub>4</sub>. Calculated: C 46.1; H 4.2; Cl 11.3; N 18.3%.

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