

3) G. B. Payne, *J. Org. Chem.*, **26**, 663 (1961).

TABLE I. PREPARATION OF ETHYL β -ARYL- α -CYANOGLYCIDATES (II) FROM ETHYL α -CYANOCINNAMATES (I)

X	Reaction ^{a)} time, hr	Mp, °C (Bp, °C/mmHg)	Yield (%)	Formula	Calcd (%)			Found (%)		
					C	H	N	C	H	N
H	15	(130—133/3)	30	C ₁₂ H ₁₁ O ₃ N	66.35	5.10	6.45	65.93	5.31	6.02
NO ₂	1	123—124	96	C ₁₂ H ₁₀ O ₅ N ₂	54.96	3.84	10.68	54.91	3.83	10.65
CN	6	125—127	98	C ₁₃ H ₁₀ O ₃ N ₂	64.46	4.16	11.57	64.29	4.17	11.57
Cl	15	70	81	C ₁₂ H ₁₀ O ₃ NCl	57.27	4.00	5.57	57.22	4.02	5.41
					(Cl, 14.08)			(Cl, 14.01)		
CH ₃	15	recovery of I								
OCH ₃	15	recovery of I								
OH	15	recovery of I								

a) Reaction temp., 80—85°C

washed with ethanol, and dried. The potassium salt was dissolved in water and neutralized with hydrochloric acid at 0—5°C. After the mixture had stood overnight in an ice box, the resulting precipitate was collected by filtration. The yield was 80%. Recrystallization from benzene gave colorless needles of IV; mp 107°C (decomp) (lit,³) mp 106—108°C (decomp). Found: C, 50.71; H, 4.84; N, 9.85%.

Reaction of IV with Ammonia. Epoxy acid, IV (1.4 g), was dissolved in concentrated aqueous ammonia (6 ml) and allowed to stand overnight at room temperature. The solution was then concentrated under a vacuum to dryness. Recrystallization from ethanol afforded colorless needles; mp 193°C (decomp). The yield was 1.4 g (89%). The product had an empirical formula in agreement with that of 3-amino-2-cyano-2-hydroxy-3-methylbutyric acid or its isomer, 2-amino-2-cyano-3-hydroxy-3-methylbutyric acid (VIII).

Found: C, 45.95; H, 6.36; N, 18.06%. Calcd for C₆H₁₀O₃N₂: C, 45.56; H, 6.37; N, 17.71%.

Decarboxylation of IV. The epoxy acid, IV, was placed with anhydrous sodium sulfate or liquid paraffin in a Claisen flask and heated in an oil bath at 140—150°C until the decarboxylation had ceased. The product was then distilled directly from the reaction flask. Redistillation gave 3-methyl-2-oxobutyronitrile (V); bp 115—120°C (lit,⁴) bp 116—118°C (yield, 45%).

The reaction of a sample of the keto nitrile, V, with aniline gave isobutyranilide (VI); mp 105°C (lit,⁵) mp 106—107°C. Found: C, 73.70; H, 8.81; N, 7.74%.

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4) W. Tschelinzeff and W. Schmidt, *Ber.*, **62**, 2210 (1929).5) O. Diels and K. Pflaumer, *ibid.*, **48**, 223 (1915).