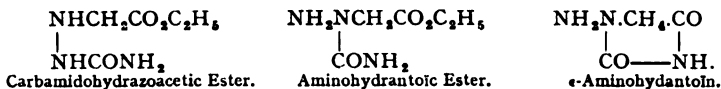


(1) by heating urea and hydrazine hydrate to 100° (J. pr. Ch. [2] 52, 465); (2) from hydrazine sulphate and potassium cyanide; (3) from amidoguanidine (B. 27, 31, 56); (4) from nitrourea (A. 288, 311). *Acetaldehyde Semicarbazone*, $\text{NH}_2\text{CONHN}:\text{C}(\text{CH}_3)_2$, m.p. 162° , is prepared from aldehyde ammonia and semicarbazide hydrochloride (A. 303, 79). With benzaldehyde it yields *Benzal Semicarbazide*, $\text{NH}_2\text{CONHN}=\text{CHC}_6\text{H}_5$, m.p. 214° . *Acetone Semicarbazone*, $\text{NH}_2\text{CONHN}:\text{C}(\text{CH}_3)_2$, m.p. 187° , passes into bisdimethyl azimethylene (p. 228) (B. 29, 611).

Acetoacetic Ester Carbazone, $\text{NH}_2\text{CONHN}:\text{C}(\text{CH}_3)\text{CH}_2\text{CO}_2\text{C}_2\text{H}_5$, m.p. 129° (A. 283, 18), readily passes into a lactazam. Semicarbazide condenses with benzil to 1,2-diphenyl oxytriazine (Vol. II.). Semicarbazide is a reagent for aldehydes and ketones.

Alkyl Semicarbazides are obtained (1) by reduction of the nitroso-alkyl-ureas (p. 441); (2) from alkyl hydrazines by means of isocyanic acid or its esters, whereby the secondary NH-group receives the carbamide residue. The alkyl semicarbazides only react easily with the aldehydes when the hydrazine NH_2 -group is free (C. 1901, I. 1170; B. 37, 2318). *2-Methyl Semicarbazide*, $\text{NH}_2\text{N}(\text{CH}_3)\text{CONH}_2$, m.p. 113° . *2,4-Methyl Ethyl Semicarbazide*, $\text{NH}_2\text{N}(\text{CH}_3)\text{CONHC}_2\text{H}_5$, is an oil. *1,2-Dimethyl Semicarbazide*, $\text{CH}_3\text{NHN}(\text{CH}_3)\text{CONH}_2$, m.p. 116° (B. 39, 3263).

Carbamidohydrazoacetic Ester, m.p. 122° , and *Aminohydantoic Ester*, m.p. $70-74^{\circ}$, are prepared from hydrazinoacetic ester (p. 397) and cyanic acid (B. 31, 167). *6-Aminohydantoïn*, m.p. 244° , forms the partial result of the loss of alcohol to aminohydantoic ester:



Carbohydrazide, $\text{NH}_2\text{NH}.\text{CO}.\text{NHNH}_2$, m.p. $152-153^{\circ}$, is obtained from the carbonic ester and hydrazine hydrate on heating to 100° (J. pr. Ch. [2] 52, 469). *Dibenzal Carbohydrazide*, $\text{CO}(\text{NHN}=\text{CHC}_6\text{H}_5)_2$, m.p. 198° .

Imidodicarboxylic Hydrazide, $\text{NH}(\text{CONHNH}_2)_2$, m.p. 200° with decomposition, is obtained from nitrogen tricarboxylic ester and hydrazine. It is easily decomposed into N_2H_4 and urazole (see below) (B. 36, 744).

Hydrazodicarbonic Ester, *Hydrazicarboxylic Ester*, $\text{C}_2\text{H}_5\text{OCONHNHCOO}.\text{C}_2\text{H}_5$, m.p. 130° , b.p. with decomposition about 250° , and is prepared from hydrazine and $\text{Cl}.\text{CO}_2\text{C}_2\text{H}_5$ (B. 27, 773; J. pr. Ch. [2] 52, 476).

Hydrazodicarbonamide, *Hydrazoformamide*, $\text{NH}_2\text{CO}.\text{NHNH}.\text{CONH}_2$, m.p. with decomposition 245° . It is obtained from potassium cyanate and salts of diamide or hydrazine: NH_2NH_2 . It also results upon heating semicarbazide (B. 27, 57), and from *Azodicarbonamide* (see below) by reduction. It yields the latter upon oxidation (A. 271, 127; B. 26, 405). NaOCl partially decomposes it into hydrazoic acid, carbon dioxide, and ammonia (J. pr. Ch. [2] 76, 433).

Azodicarboxylic Acid, *Azoformic Acid*, $\text{CO}_2\text{HN}=\text{NCO}_2\text{H}$, is prepared from azodicarboxylic amide and concentrated potassium hydroxide solution, in the form of yellow needles. Its potassium salt deflagrates at 100° . It readily decomposes in aqueous solution into CO_2 , potassium carbonate, diamide, and nitrogen. It is not possible to obtain from it the still unknown *diimide* $\text{NH}=\text{NH}$. *Diethyl Ester*, b.p. 106° , is prepared from the hydrazo-ester (see above) and nitric acid. It is an orange-yellow oil.

Azodicarboxylic Amide, *Azoformamide*, $\text{NH}_2\text{CON}=\text{NCONH}_2$, is formed (1) by the oxidation of *hydrazodicarboxylic amide* with chromic acid, and (2) from *azodicarboxylic diamidine*, $\text{NH}_2\text{C}(\text{NH})\text{N}:\text{NC}(\text{NH})\text{NH}_2$ (p. 458). It is an orange-red powder.

Carbamic Acid Azide, *Azidocarbonic Amide*, N_3CONH_2 , m.p. 97° , is prepared from semicarbazide and nitrous acid; and by the combination of hydrazoic and cyanic acids. Silver nitrate decomposes it into silver cyanate and silver azide; when heated with water it is split up into N_2H_4 , NH_3 , and CO_2 . Hydrogen sulphide reduces the azide to urea (A. 314, 339). Hydrocyanic acid unites with it to form *urea azocyanide*, *carbamidocyanotriazene*, $\text{NH}_2\text{CONHN}:\text{NCN}$.

Carbodi azide, *Carbazide*, *Nitrogen Carbonyl*, $\text{CO}(\text{N}_3)_2$, is produced from carbohydrazide and nitrous acid:

