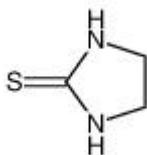


**FC-040 (CAS 96-45-7) 2-Imidazolidinethione****BASIC  
INFORMATION**

Cas: 96-45-7  
Name: 2-Imidazolidinethione,NA 22;ETU;ethylene thiourea;ACCEL-BF;mercazini;robac22;Mercozen;2-thioxo imidazolidine;2-Thioxoimidazolidine;N,N'-ethylenethiourea;2-imid azolidine-thione;NA-22-D;imidazoline -2-thione;  
Molecular formula: C3H6N2S  
Molecular weight: 102.15800  
PSA: 56.15000  
LOGP: 0.12170

**PHYSICAL INDEX**

Appearance and properties: white to light green crystalline powder  
Density: 1.41~1.45  
Boiling point: 148.3° C at 760 mmHg  
Melting point: 196-200 ° C(lit.)  
Flash point: 252 ° C  
Refractive index: 1.664  
Water solubility: 19 g/L (20 ° C)  
Stability: Stable under normal temperatures and pressures.  
Storage conditions: 0-6° C

**SECURITY  
INFORMATION**

RTECS number: NI9625000  
Safety instructions: S53-S45  
WGK Germany: 2  
Hazard category code: R22; R61  
Dangerous goods transport code: 2811  
Customs code: 29332990  
Hazard category: 6.1(b)  
Packing level: III  
Dangerous goods mark: T

Signal word: Danger

Hazard description: H302; H351; H360D; H372

Hazard prevention statement: P201; P281; P308 + P313

Danger signs: GHS07, GHS08

production method

1. In the glass-lined reactor, add water and ethylenediamine, reduce the temperature by 20° C, add carbon disulfide, control at 35-40° C, react for 4 hours, heat up and recover carbon disulfide to generate vinyl dithiocarbamate. The vinyl dithiocarbamate is cooled to below 50° C, hydrochloric acid is added, and hydrogen sulfide is released when the temperature is raised, and cyclized to produce ethylene thiourea. In the cyclization reaction, acetic acid can also be used instead of hydrochloric acid for the reaction, and the obtained crude ethylene thiourea is dissolved in boiling water, filtered, cooled to precipitate crystals, dehydrated, dried, and pulverized to obtain the finished product. (Kg/ton) Ethylenediamine (70%) 740 Carbon disulfide (95%) 1250. 2. Put 24 kg of ethylenediamine, 48 kg of industrial alcohol, and 60 kg of distilled water into the reactor in turn. Under stirring, slowly add 32 kg CS<sub>2</sub>, and control the temperature at about 60 °C during the dropping process. After adding CS<sub>2</sub>, the temperature was raised to 100 °C and refluxed for 1 h. Then add 3.6 kg of concentrated hydrochloric acid and reflux for 9-10 h. Cool to crystallize. The product was obtained by suction filtration, washing and drying with acetone. The yield is about 80%-85%. 3. Using water as the reaction medium, carbon disulfide and ethylenediamine as raw materials to prepare ethylene thiourea (accelerator NA-22 or ETU), the reaction is carried out in two steps. ①Carbon disulfide undergoes addition reaction with ethylenediamine under the action of water to produce the intermediate product ethylamine for aminosulfuric acid: The second step is the cyclization of ethylamine for aminosulfuric acid under the action of water to obtain the final product ethylene sulfide Urea:

**PRODUCTION  
METHODS AND  
APPLICATION**

use

ETU is an overspeed accelerator used in chloroprene. Must be used together with zinc oxide and magnesium oxide. It vulcanizes well above 121° C. It can strengthen the tensile force of rubber, has low compression set, but has high elasticity and good anti-aging performance.

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