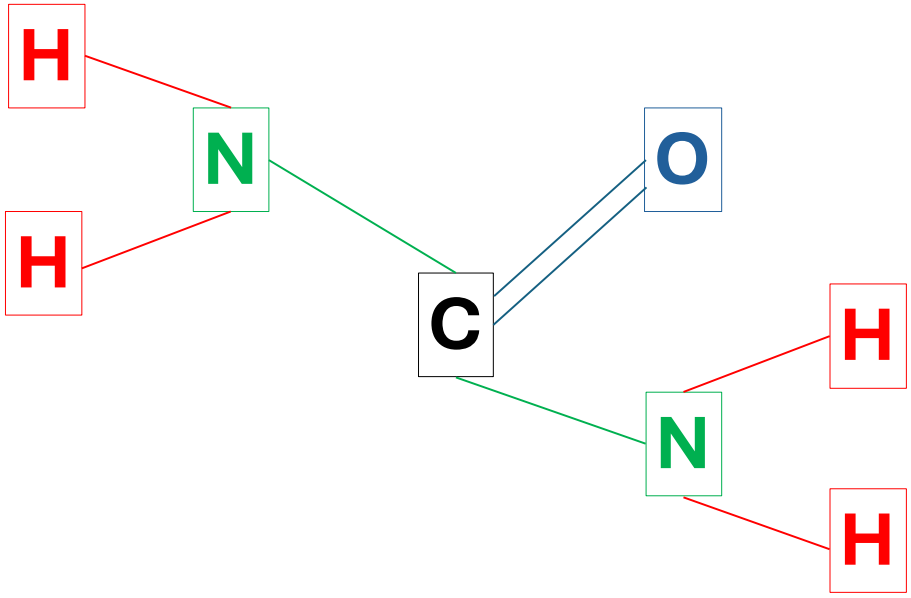
Chemical of the Week – Part 2

Hazard Profile	
Chemical Name and Pseudonyms	Urea, Carbamide, Carbonydiamide, Ureophil, 57-13-6
UN Number	-
Chemical Formula	CH^4N^2O
NFPA Hazard Class (H-F-R-Ⓞ)	1 – 0 – Ⓞ - Ⓞ
Hazards	Eye, skin, and respiratory irritant. Combustible solid. May react with other materials.
PPE Considerations	SFPC with SCBA or full-face APR/PAPR based on assignment
Fire Fighting Considerations	Water, ATC AFFF, dry chem, $CO_{2.}$. May violently decompose when heated or involved in fire.
Decontamination	Water or water with surfactant.
Detection and Monitoring	spectroscopy, colormetric,
Chemical and Physical Properties	
Physical State	Solid white prill or powder with ammonia like odor
Vapor Pressure	.0000012 mm/Hg
Boiling Point	Decomposes
Vapor Density	-
Specific Gravity	1.34
Miscibility/Solubility	Very soluble in water
Flash Point	-
LEL/UEL	- / - %
Autoignition Temp	-
pH	7.5-9%
Toxicity	
IDLH	-
AEGL1/AEGL 2/AEGL 3 – 10 Min	- / - / -
Protective Action Criteria (PAC) 1/2/3	30 / 280 / 1700 mg/m^3
Emergency Response Planning Guides (ERPG)	- / -/ -
PEL/REL/STEL	15 / 10 / -
LD50	8471 mg/kg (oral)
LC50	-
Radioactive (Yes/No)	No
Medical	

Toxicological Considerations	Irritant to skin, eyes, and respiratory tract.
Signs/Symptoms of Exposure	Irritation or eyes, skin, mucosa, shortness of breath, coughing, wheezing
Medical Treatment	Fresh air, water flush, treat symptomatically

Other Information

UREA is a weak base. Reacts with hypochlorites to form nitrogen trichloride and phosphorus pentachloride. which explode spontaneously in air. It reacts with azo and diazo compounds to generate toxic gases. Reacts with strong reducing agents to form flammable gases (hydrogen). The heating of urea and sodium nitrite lead to an explosion. Heated mixtures of oxalic acid and urea yielded rapid evolution of gases, carbon dioxide, carbon monoxide and ammonia.

Chemical Structure