

ACS is committed to helping combat the global COVID-19 pandemic with initiatives and free resources.

[Learn More](#)

You are here: » [American Chemical Society](#) » [Molecule of the Week](#) » [Molecule of the Week Archive](#)
» [Archive - A](#) » Azidoazide azide

[Molecule of the Week Archive](#)

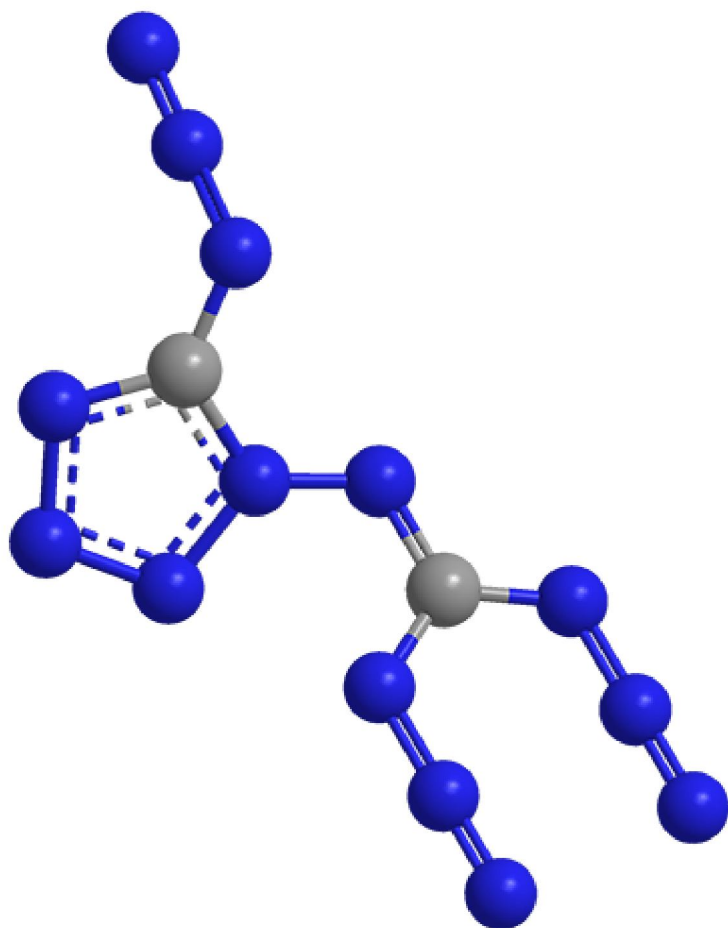
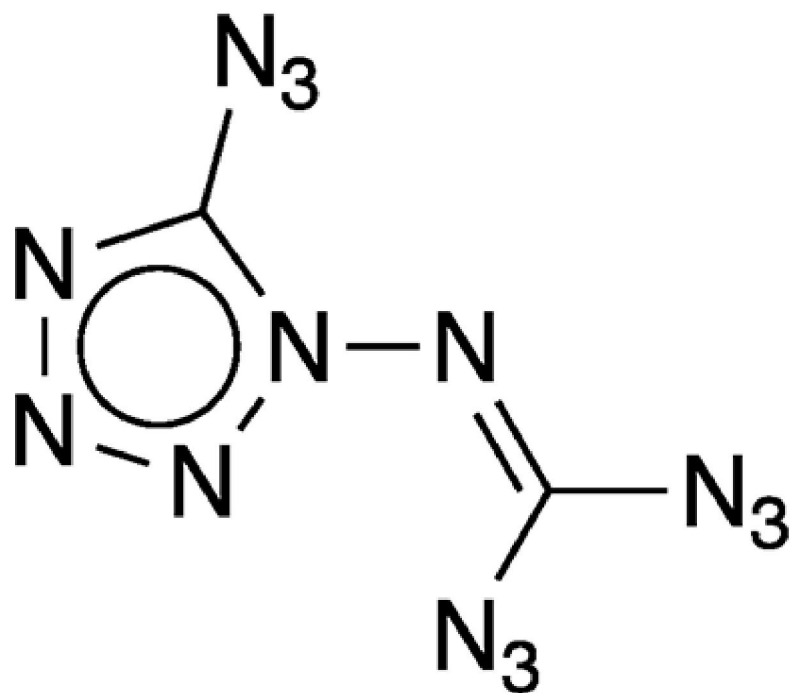
Azidoazide azide

August 17, 2020

[Previous](#)

You'll get a bang out of making me.

What molecule am I?



1-Diazo-5-azido-1H-tetrazole-5-carbonyl diazide, informally called "azidoazide azide", is a heterocyclic organic compound crammed with 14 nitrogen atoms. Because of the large number of high-energy nitrogen bonds, the compound is extremely explosive.

Azidoazide will explode if

- touched,
- moved,
- dispersed in solution,
- exposed to bright light, or

- even left undisturbed on a glass plate.

Like all azides, it reacts with water to emit explosive, highly toxic hydrogen azide.

Azidoazide azide has been called "[the most dangerous explosive material in the world](#)." It is also No. 3 in K. S. Lane's list "[The 10 Most Dangerous Chemicals Known to Man](#)".

Thomas M. Klapötke*, Franz A. Martin, and Jörg Stierstorfer at Ludwig Maximilian University (Munich, Germany) reported the [synthesis of azidoazide azide](#) in 2011. They were able to (carefully!) prepare a single crystal for X-ray diffraction measurements. The authors stated, "The shock and friction sensitivity of [azidoazide azide] no doubt lies well under the limits of 0.25 J in impact and 1 N in friction sensitivity that can be experimentally determined."

Because of its extreme sensitivity, no meaningful hazard information on azidoazide azide has been reported. For some interesting takes on azidoazide azide, see Derek Lowe's "[Things I Won't Work With: Azidoazide Azides, More or Less](#)" and Ashutosh Jogalekar's "[Virtual Shock](#)".

MOTW update

Benzyne was the Molecule of the Week for [August 10, 2020](#). The article began, "Benzyne is a highly reactive organic molecule that has not been isolated." A sharp-eyed reader wrote to say that this isn't exactly true. In 1997, Ralf Warmuth at UCLA [generated benzyne in the inner cavity of a hemicarcerand](#) by irradiating incarcerated benzocyclobutenedione at $-196\text{ }^{\circ}\text{C}$, followed by irradiating the resulting hemicarcerand–benzocyclopropenone under the same conditions.

The Molecule of the Week staff thanks the many readers who have sent us suggestions during the past several months. We publish all of the molecules that we think are of interest to our readers—which is to say, almost all of them. If you have a molecule you would like us to consider, please e-mail it to motw@acs.org.

Azidoazide azide fast facts

CAS Reg. No.	1306278-47-6
SciFinder nomenclature	Carbonimidic diazide, <i>N</i> -(5-azido-1 <i>H</i> -tetrazol-1-yl)-
Empirical formula	Empirical formula
Molar mass	220.12 g/mol
Appearance	Red crystals
Melting point	78 °C
Water solubility	Dec. to HN_3



[Learn more about this molecule from CAS](#), the most authoritative and comprehensive source for chemical information.

Follow @MOTW_ACS

[Twitter](#)



**MOVING CHEMISTRY FROM
BENCH TO MARKET**

ACS Fall 2020 Virtual Meeting & Expo

Gain access to cutting-edge research with over 6,000 papers, 250+ broadcast sessions, video networking and more!

[Register today!](#) >

Molecule of the Week needs your suggestions!

If your favorite molecule is not in our [archive](#), please send an email to motw@acs.org. The molecule can be notable for its current or historical importance or for any quirky reason. Thank you!