

# In deep memory of Professor Rolf Huisgen, a great chemist, who passed away on March 26, 2020

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## Rolf Huisgen

(June 13, 1920 – March 26, 2020)

Professor, Emeritus  
Department of Chemistry  
Ludwig-Maximilians University of Munich  
Germany

### Education

**1939–1940** Diploma, University of Bonn & University of Munich  
**1940–1943** Ph.D., University of Munich (Supervisor: Prof. Heinrich Wieland)

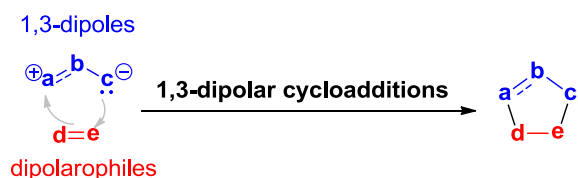
### Experience

**1943–1949** Research Assistant, University of Munich, Germany  
**1947** Received his habilitation, University of Munich, Germany  
**1949–1952** Associate Professor, University of Tübingen, Germany  
**1952–1988** Professor and Head of the Organic Chemistry Institute, University of Munich, Germany  
**1988–2020** Emeritus Professor, University of Munich, Germany

### Selected Awards

Liebig Memorial Medal of the German Chemical Society (1961);  
Roger Adams Award of the American Chemical Society (1975);  
Otto Hahn Prize in Chemistry and Physics (the highest prize in science in Germany; 1979);  
Citation Laureate of "Nobel Class" 2019 in Chemistry (2019).

### Scientific Contributions



Rolf Huisgen named the reaction, systematically classified 1,3-dipoles, and predicted yet-unknown 1,3-dipoles.

The contributions of Professor Rolf Huisgen to organic chemistry are numerous. His research interests mainly focused on the organic reaction mechanism, 1,3-dipolar cycloadditions, and orbital control of reactivity, among others. In the early days it was the chemistry of diazo compounds that attracted his interest. His group was able to increase the synthetic possibilities of this chemistry and to broaden the mechanistic knowledge about the reactions of diazo- and diazonium compounds. The reactions of N-nitrosoacylamides were studied in depth leading to formulation of alkanediazonium ion pairs and the subsequent formation of carbocations in various product forming steps. Medium sized rings and benzyne chemistry were his main activities in 1950s. The discovery of the existence of penta-zoles, a long sought-after class of compounds, is certainly one of his great scientific achievements. His most widely recognized contribution to chem-

istry is the development of general concepts of 1,3-dipoles and 1,3-dipolar cycloadditions (nowadays known as "Huisgen reactions" or "Huisgen chemistry"). Although scattered examples of reactions of alkenes with molecules (later called 1,3-dipoles) could be found in the literature, it was Huisgen's great achievement and merit to have recognized the general principle and to have exploited the chemistry of 1,3-dipolar cycloadditions. In early 1960s, he discovered new 1,3-dipoles that followed from the formulation of the underlying principle. During the following 40 years, his group and many followers have developed 1,3-dipolar cycloadditions as the most powerful tool to synthesize five-membered heterocyclic compounds. Professor Huisgen published more than 600 scientific papers in various areas of mechanistic, physical-organic, and heterocyclic chemistry and established a school of distinguished academic scholars in Germany and around the world.

### References

- (a) Sustmann, R. *Rolf Huisgen (Preface)*, *Tetrahedron* **2000**, *56*, vii-viii. (b) Houk, K. N.; Reissig, H.-U. *Rolf Huisgen's Legacy*, *Chem* **2019**, *5*, 2499-2505. (c) Houk, K. N. *Rolf Huisgen's Profound Adventures in Chemistry*, *Helv. Chim. Acta* **2010**, *93*, 1241-1259.
- Key publications of Professor Rolf Huisgen: (a) Huisgen, R. *1,3-Dipolar Cycloadditions, Past and Future*. *Angew. Chem. Int. Ed. Engl.* **1963**, *2*, 565-598. (b) Huisgen, R. *1,3-Dipolar Cycloadditions - Introduction, Survey, Mechanism*, in *1,3-Dipolar Cycloaddition Chemistry*, Padwa A. (Ed.), Wiley-Interscience, New York, **1984**, Chapter I, 176p. (c) Huisgen, R. *The Adventure Playground of Mechanism and Novel Reactions*, in *Profiles, Pathways, and Dreams*. Seeman, J. I. (Ed.), American Chemical Society, Washington, DC., **1994**, 279p.

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