

On the 150th anniversary of Markovnikov Rule

Dear Editor Secen,

In 1869, **Vladimir Vasilyevich Markovnikov**, a Russian organic chemist from the University of Kazan formulated in his doctoral thesis the famous rule which is named after his name. According to this rule: *When an unsymmetrically substituted unsaturated hydrocarbon reacts with hydrogen halides, the halide adds to the least hydrogenated carbon, that is to the one which experience more influence from the other neighbouring carbons.* In other words: *when an unsymmetrical alkene reacts with a hydrogen halide, the hydrogen adds to the carbon that has the greater number of hydrogen substituents, and the halogen to the carbon having the fewer number of hydrogen substituents*” Markovnikov’s rule predicted the regioselectivity of electrophilic addition reactions

of alkenes. This rule was an important milestone in the development of the structural theory in organic chemistry. The chemical basis for Markovnikov's Rule is the formation of the most stable carbocation during the addition process. In 1933 Karasch described the addition of hydrogen bromide in the presence of peroxides to unsymmetrically substituted alkenes and the formation of a product called as Anti-Markovnikov product. Hydroboration reaction also forms the Anti-Markovnikov products.

In all these reactions the electrophiles (H^+ , $Br\cdot$, and BH_3) attack the carbon atom with the greater number of hydrogen substituents forming the most stable intermediate. However, the students are getting ignored. They assume that the anti-Markovnikov addition results in the formation of the least stable intermediate. Therefore, I assume, that this formulation of Anti-Markovnikov addition for radical addition and hydroboration should be changed.

Lomonosov Moscow State University and Kazan Federal Universities jointly organized a conference *Markovnikov Congress on Organic Chemistry dedicated to the 150th anniversary of the discovery by the Russian chemist Vladimir Vasilyevich Markovnikov in 1869 this year.* This congress was attended by 117 well selected invited speakers from around the world, as well as more than 400 scientists.

As Markovnikov was the founder of the Moscow University School of Chemistry and graduated from Kazan Chemical School, the conference started on 21th June in Moscow as Pre-symposium and the main part was held on 24-28, 2019 in Kazan. The quality of this congress was very high. The participants had also the opportunity to visit Markovnikov’s laboratory and the historical sites of Moscow and Kazan.

Thanks to the organizers...

Metin Balci 

Emeritus Professor

Middle East Technical University

Ankara/Turkey

E-Mail: mbalci@metu.edu.tr

ORCID 

Metin Balci: [0000-0003-4443-9245](https://orcid.org/0000-0003-4443-9245)

Received July 31, 2019; Published online August 23, 2019

Keywords: Markovnikov Rule; Vladimir Vasilyevich Markovnikov © 2019 ACG Publications. All rights reserved.