

Essay titles

- The assumptions and applications for covalent radii
- How do dispersion effects arise?
- The driving forces behind the Periodic System
- Explain hybridization defects for heavy main-group elements and why they are small for p-block elements in the 2nd period
- Summarize the factors influencing the shape of d^0 transition-metal molecules
- The valence chemistry of lanthanides and actinides (Chem. Soc. Rev. 32 (2003) 9)
- The hydrogen bond
- Electron correlation effects on chemical bonding
- The "Homework" given in the lecture notes of Prof. Knowles
- Hückel and Möbius aromaticity
- Molecular aromaticity and ring currents
- Methods to determine the degree of aromaticity
- Chemical bonding, electron pairing, and electron pairing
- Topological analysis and chemical bonding
- Multiple bonds between actinides and first-row elements
- The role of the kinetic-energy operator in the formation of chemical bonds
- Bond orders and density matrices
- The "homework" given in the lecture notes
- The role of Pauli repulsion in chemical bonding
- Discuss bonding in compounds of zero-valent carbon
- Describe energy decomposition analysis
- Own title of relevance for the Winter-School theme