Chemical Applications of Group Theory

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Chemical Applications of Group Theory

What does that mean?

Consequences of molecular symmetries!

All molecular properties are related to symmetry:

- Electronic structures depend on symmetry
- Spectroscopic features depend on symmetry

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Who should take the course?

Everyone interested in molecules!

Researcher from the areas of

- Organic Chemistry
- Inorganic Chemistry
- Theoretical Chemistry

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What to expect?

- Almost everything will be developed in class
- Practice examples in class (20 – 30)
- Homework assignments for further practice
- Deeper thinking about molecular symmetry is fun!

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Structure of the Course

- **PART A: Fundamental Concepts**
  point-group symmetries, representation of a group …

- **PART B: Applications of Group Theory**

  - Normal Modes of Molecules (Vibrational Spectroscopy)

  - Transition Moments and Symmetry
    (e.g., UV/VIS Spectroscopy)

  - Bonding in Molecules
    (e.g., How to sketch (understand) a MO diagram)

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What is the learning outcome of the course?

A deeper understanding of molecules (chemistry)!

QUESTIONS ???

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