1. Classical model of a line shape of atomic absorption.
2. Natural line broadening
3. Doppler broadening of atomic/molecular transitions
4. Collisional broadening of atomic/molecular transitions
5. Transition time linewidth broadening mechanisms
6. Beer-Lambert law and its application in spectroscopy
7. Laser spectroscopy with cavities
8. Fluorescence excitation spectroscopy
9. Spectroscopy methods using lasers
10. Ionization spectroscopy with lasers
11. Frequency combs: principle of operation
12. Continuous wave laser spectroscopy using frequency combs
13. Applications of frequency combs
14. Doppler-free saturation spectroscopy
15. Polarization spectroscopy
16. Doppler free two-photon spectroscopy
17. Mass spectroscopy: exemplary methods, applications, principles
18. Ionization methods for mass spectroscopy studies
19. Quadrupole mass filter: principle of operation, applications
20. Penning trap: principle of operation, applications
21. Photoassociation spectroscopy: principles, experimental signatures, applications
22. Feshbach spectroscopy
23. Measurements of binding energies of molecules
24. Quantum logic spectroscopy: principle of the method, applications
25. Quantum jump spectroscopy: principle of the method, applications
26. Principles and applications of Raman spectroscopy