

Suggested Chem 199 topics for the Nizkorodov group

In Chem 199, you will be offered a certain research topic for self-study. This is a textbook and literature survey type of assignment, in which you are going to learn about a particular research subject (for example, chemistry or atmospheric mercury, indoor chemistry of ozone, chemical fate of common pesticides, etc.) or a particular method (for example, absorption spectroscopy). You will be reading books and research papers, and your advisor, Prof. Nizkorodov, will guide you in your self-study.

The first group of topics is appropriate for beginning students who need to learn about various analytical methods before they can learn about their scientific applications. Here is a list of some of the technical topics related to our group:

1. Analysis of liquids by UV/Vis absorption spectroscopy (a method we use a lot)
2. Analysis of films, gases, and liquids by FTIR spectroscopy
3. Separation of mixtures by liquid chromatography
4. Separation of mixtures by gas-chromatography
5. Common types of mass analyzers
6. Analysis of particles by mobility methods (scanning mobility particle sizer)
7. UV radiation sources for photochemistry (lamps, lasers, LEDs, illuminators)
8. Advanced: cavity ring down spectroscopy with pulsed lasers (advanced topic)
9. Advanced: chemical kinetics modeling of photooxidation of organics in a smog chamber (need to know Matlab or Mathematica).

The second group of possible topics is closely tied to the Nizkorodov group research. Some of these topics are fairly advanced. If you do not see a topic you like, feel free to suggest your own. Suggested publications from the group can be found [here](#) (click on PDF to get the full paper).

10. Applications of high-resolution mass spectrometry methods to analysis of atmospheric aerosols. See publications 51, 56, 61, 64, 67, 68, 70, 71, 72, 79, 83, 84, 85, 96, 100, 116, 118 and references therein
11. Light-absorbing atmospheric aerosols. See publications 62, 66, 72, 77, 89, 93, 95, 99, 101, 105, 107, and references therein.
12. Photodegradation and photochemistry of organic aerosols. See publications 50, 57, 60, 91, 93, 97, 98, 111 and references therein
13. Viscosity of organic aerosols. See publications 91, 92, 110 and references therein
14. Photochemistry in fog and cloud droplets. See publications 69, 80, 99 and references therein
15. Indoor chemistry of ozone. See publications 45, 49, 54 and references therein.
16. Oxidation of environmental surfaces by ozone. See publications 43, 46, 47, 108 and references therein.
17. Photochemistry of atmospherically relevant molecules in water and in ice. See publications 63, 76, 78, 88, 90 and references therein.
18. Fluorescent aerosols. See publication 62, 87 and references therein.

Useful links for finding research articles and information on chemistry related topics:

- [SciFinder Scholar](#)
- [Web-of-Science](#)
- [UCI library resources in chemistry](#)