

ABSTRACT

Demonstrations are considered an important illustrative tool in chemistry education. Quite often teachers use demonstrations of experiments and multimedia demonstrations. Besides, “non-experimental” demonstrations might also be useful, such as material models and demonstrations based on macroscopic analogy that can be usually carried out only with household items and materials.

This dissertation is especially aimed at selecting appropriate demonstrations, at their design, development and use of “non-experimental” demonstrations. Moreover, special attention was paid to the interdisciplinary demonstrations concerning the nanoworld, so called “nanodemonstrations”. All “nanodemonstrations” presented are safe, cheap and rather timesaving. Furthermore, they can be carried out in a form of lecture and / or students’ demonstration. Newly created as well as adopted (and modified) “nanodemonstrations” were collected into the Czech database of “nanodemonstrations”. The database was additionally accompanied with following educational materials concerning “nano”: two PowerPoint presentations, worksheets that supplement students’ “nanodemonstrations” and worksheets with interdisciplinary tasks.

This thesis also deals with the evaluation of “nanodemonstrations” and worksheets in secondary school classes. The results confirmed that the implementation of “nano“ into secondary education is worthwhile, although it is demanding and requires an interdisciplinary approach.