

# ALGORITHM OF ANTI-SCIENTIFIC MYTHS REFUTATION BY SCALING OF THE TYPICAL TASKS AND EXPERIMENTS IN CHEMISTRY

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*“Official science would not tell this”* – is an intriguing phrase, widely used by... “modern” promoters of the anti-scientific myths and of the social ignorance. The media space is filled with myths, the absurdity of which is obvious to chemists, but which are easily accepted by a significant part of the population thanks to simple, attractive and understandable answers. Here are some of them: *“All food additives with the E-code are evil”, “Palm oil is a poison”, “Hydrogen peroxide, iodine, soda and lemon-water treat all diseases”, “The most correct and healthy lifestyle is vegetarian”, “Well water is always cleaner and safer than tap water”, “Airplanes specially throw chemical trails with harmful substances”, “Nuclear energy is not environmentally friendly and should be banned immediately”* and many others.

Modern education process often does not have enough time to raise a barrier to such ignorant aberrations, for several reasons: 1. Volume limited school curriculum does not cover all aspects of modern life. Moreover, curriculum cannot be quickly adapted to all new challenges, since, unfortunately, it is rather inert. 2. Our official scientific agenda is losing ground to a massive flow of false anti-scientific information, since false

information is usually less boring and more emotional, and therefore, easier to “enter” the minds. 3. We rarely allow ourselves to go beyond typical tasks and experiments.

And yet, we, teachers of chemistry, can and must systematically demonstrate inconsistency of each new or long-rooted myth or fake. Regardless of whether our students are in school walls or out of it, our routine daily aim is to help them use the richest theoretical and experimental arsenal of chemistry, to think critically, questioning and fact-checking all incoming information, finding its quantitative confirmation or refutation.

The inconsistency of anti-scientific myths cannot be based only on the categorical statement “no, this is all wrong,” that is, it should not be imperative and unsubstantiated. The algorithm for refuting the myth should be based on scientific true and to strength real knowledges, bringing the myth to the point of absurdity, perhaps even to the point of regret that this was initially believed. It can include the following steps:

- **translation of the myth content** into the language of typical chemical task or experiment;
- usually **solving of a chemical task** and/or setting up and realisation of experiment;
- **numerical binding** of the process and of the tasks’ solving results to the myths content;
- **demonstration** of the myth’s inconsistency, **based on numerical and/or experimental data**, that is equal to convincing, reasoned myth’s refutation;
- a brief discussion and conclusion about harm of anti-scientific mythology for the society, economy and for true **understanding of the real picture of the world.**