



# Hungarian Chemistry Tournament Problem Set

## Problem 1: Biosensor sword

Frodo had a sword of unmatched properties. It is outstanding of a sword: it is easy to sharp and unusually strong, cutting through orcs, giant spiders and wood without effort. Its most astonishing property is, on the other hand, the glowing blue light it generates when orcs or goblins are nearby. Is it possible to build a similar weapon that lights when rival species of your choice are in proximity?



## Problem 2: Radiotrophic Organism

The problem of handling nuclear waste is more actual than ever. How convenient it would be if you could just feed it to some animal? The imaginary monster Godzilla is known to grow on radiation, and eats ballistic missiles like candy. Propose chemistry for a mono- or multicellular lifeform which can feed on radioactivity (i. e. make energy out of it), and justify the type of radioactivity of your choice.

## Problem 3: Fire blasting dragons

In the quest for the Iron Throne, rival armies commonly exploited the effectiveness of dragons. At their peaks, their breath can melt metal armor. But how can an animal blast fire? How hot would it be?



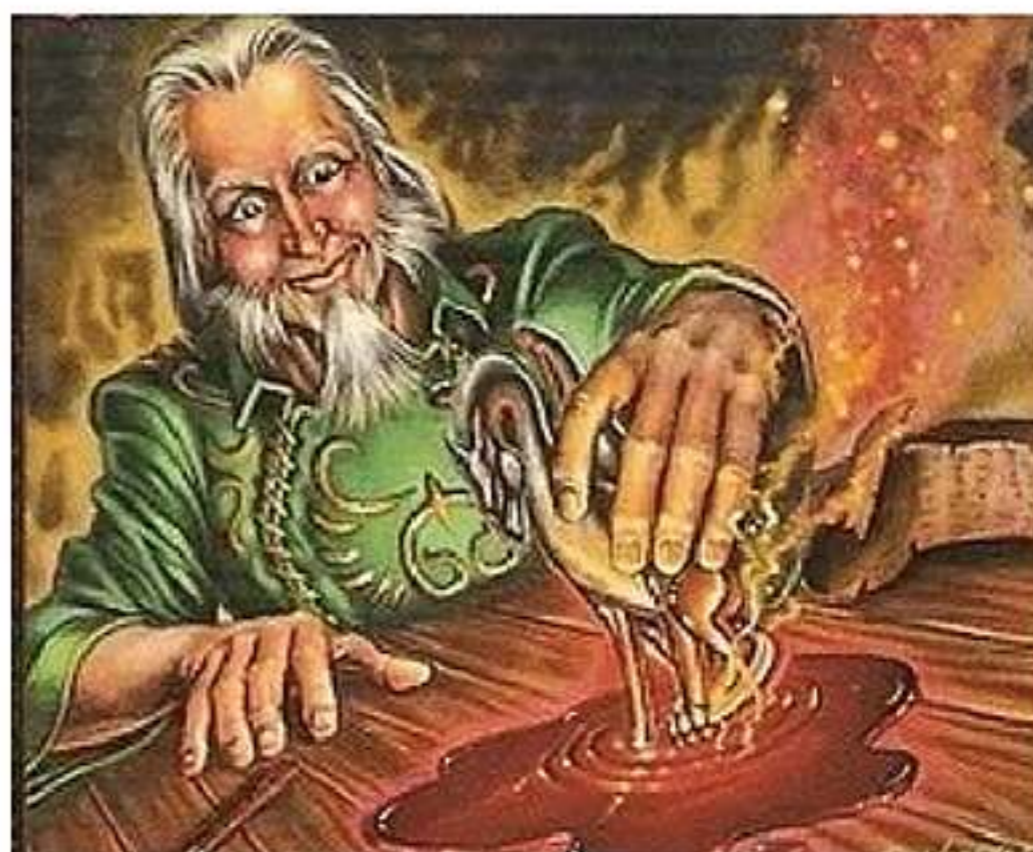


### Problem 4: The Killing Joke

Joker Venom is a toxin, the favorite murder weapon of the Joker in the Batman franchise. It is mostly used as a gas, and after inhaling it causes uncontrollable spasms of laughter, followed by a painful death. Suggest a gas or an aerosol (it can be a mixture of compounds) that would first make the victims laugh and then kill them.

### Problem 5: Golpalott's Third Law

Golpalott's Third Law states that the antidote for a blended poison will be equal to more than the sum of the antidotes for each of the separate components.' – recited Hermione Granger in Potions class in chapter 18 of Harry Potter and the Half Blood Prince. Could this law work in the muggle world? Confirm and/or defy it! If it is possible, categorize your examples and create some clarifications, supplements to the law, or – if necessary – create a whole new law instead of the original.



**May the force be with you.**

Register by 2<sup>nd</sup> December 2019.