

**Schriftlicher Teil in Englisch**  
**des obligatorischen Sicherheitskolloquiums**  
**zum Praktikum „Organische Chemie für Fortgeschrittene“**

Please answer the following questions carefully and give the completed exercise back to your assistant professor for correction and discussion.

**Teil 0: Personal Data**

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(Name, Prenom)

(Semester)

Beginning of the practical course: Semester.....

**Part 1. Disposal of Chemicals**

Please describe safe methods to dispose the following chemicals:

1. Bromine
2. Calcium chloride
3. *n*-BuLi
4. Palladium/charcoal
5. Lithiumaluminum hydride
6. Sodium

## 7. Mercury compounds

## 8. Radical initiators such as AIBN

**Part 2. Please mark correct statements with a cross.**

- In the case of a complete water failure in the chemistry building, water bottles to rinse contaminated eyes can be found in all corridors.
- Compounds of Pb(IV) have to be reduced by disulfite and then diluted with aqueous sulfuric acid before disposal.
- Benzene is toxic (T).
- Anhydrous chloroform can be obtained by heating commercially available chloroform at reflux temperature over a period of 5 h in the presence of dried calcium chloride and subsequent distillation.
- In Clausthal, calcium chloride used in desiccators can be dissolved in water and poured into the sink.
- Reaction of dichloromethane with sodium gives anhydrous  $\text{CH}_2\text{Cl}_2$ .
- For disposal, cyanide containing solutions must have pH 10-11 before oxidation by 30% hydrogen peroxide to give cyanate. The resulting solution can be poured into the sink.
- Cyanides in organic solutions must be converted with Fe(II) into blue complexes (Berliner Blau) which have to be filtered off and put into a bottle labeled with „cyanidhaltige Schlämme“ for disposal.
- Ra-Ni is pyrophoric.
- Hydrazine and its salts are carcinogenic.
- Anhydrous ethanol can be obtained by stirring azeotropic ethanol with dry sodium sulfate.
- Phosphorous pentoxide can be used as drying agent for all organic compounds in desiccators.
- Even when stored in an inert solvent, potassium forms crusts of peroxy compounds which may explode on attempts to cut off small pieces.

- **Lithiumaluminum hydride ( $\text{LiAlH}_4$ ) in residues of reactions can be deactivated by anhydrous ethyl acetate.**
- **Peroxides in THF are destroyed with copper(I)chloride.**
- **Traces of water in ethyl acetate can be eliminated with sodium.**
- **Acid chlorides often react vigorously with other chemicals in disposal bottles.**
- **It is dangerous to let long hair hang loose in laboratories.**
- **The best heating source to dry toluene with elemental sodium is silicon oil, because sodium does not react with silicon. PEG is unsuited.**
- **Tetrahydrofurane forms peroxides easier than diethyl ether.**
- **In the European Community, bombs with ethine are brown, not yellow.**
- **Sodium hydride in mineral oil can catch fire spontaneously when spilled.**
- **At the University of Clausthal, methanol is collected separately for disposal.**
- **Oxygen can be condensed in cooling traps cooled by liquid nitrogen.**
- **Burning oil baths can be extinguished by covering the beaker with thick paper or aluminum foil, whereas the addition of water to the oil leads to severe explosions.**
- **It is forbidden to store 1 liter- and 2.5 liter bottles containing organic solvents in the lab.**
- **Burning clothes, lab-coats or hair have to be extinguished with a fire blanket. It is not allowed to use fire extinguisher containing  $\text{CO}_2$ .**
- **Alkyl amines are less corrosive for skin and eyes than acids.**
- **Burning sodium cannot be put out by  $\text{CO}_2$  fire extinguisher.**
- **It is allowed to store pottasium permanganate at the side of toluene in chemical racks.**
- **Oxygen valves may not be greased.**
- **Hydrogen bombs are red.**
- **Water in emergency eye bottles must be changed once in 14 days.**

**Part 3. Please give correct answers!**

Please give 6 examples of chemicals which must not be extinguished with water when they caught fire!

Please give examples of 2 classes of compounds which are cancerogenic!

On fire alarm, everybody has to leave the institute immediately. What do you have to take care off in your lab and on the meeting place in front of the organic chemistry building?

What is the emergency telephone number in the university of Clausthal?

Please give 10 examples of security equipments in your lab and in the chemistry building.

Some years ago, a severe accident took place at the university of Ulm, Germany. During the night, a disposal bottle of used solvents caught fire and destroyed the chemistry department almost completely. Please give an example of a mixture of chemicals that can catch fire after several hours.