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**SSERC Risk Assessment** (revised version March 2018)

(based on HSE’s INDG 163 ‘Risk assessment - A brief guide to controlling risks in the workplace’)

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| Activity assessed | Ammonia fountain |
| *Date of assessment* | 24th March 2014 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | |
| --- | --- | --- | --- | --- | --- |
| *List Significant hazards here:* | *Who might be harmed and how?* | *What are you already doing?*  *What further action is needed?* | *Actions* | | |
| *by whom?* | *Due date* | *Done* |
| Ammonia gas is toxic by inhalation. | Demonstrator / technician by inhalation while preparing the flask.  Audience while watching the demonstration. | All the preparation must be carried out in a fume cupboard.  Unless the flask breaks there will be no leakage of ammonia into the room. Even if there is, the room concentration would be orders of magnitude below a hazardous level, even close to the apparatus, the low density of ammonia will ensure that most of the gas is carried upwards, away from the audience. |  |  |  |
| Ammonia solution (.880) is corrosive | Demonstrator / technician by splashes while preparing the flask of ammonia. | Wear goggles (BN ES166 3) and nitrile gloves. |  |  |  |
| Phenolphthalein solution (or any other indicator if prepared in ethanol or propanol) is highly flammable | Demonstrator / technician if the bottle of indicator ignites. | Keep indicator solution well away from any source of ignition. |  |  |  |
| Phenolphthalein (if used) is a carcinogen (cat 2) | Demonstrator / technician by inhalation, skin contact or ingestion while preparing the dilute solution. | Wear gloves and eye protection, avoid raising dust.  Ensure solution is less than 1% in concentration (below which it is not classified as hazardous). |  |  |  |
| The flask may implode. | Demonstrator (possibly audience) by flying glass. | Wear eye protection. Use a strong, borosilicate, round-bottomed flask. Or some other strong flask.  Keep audience at least 2 m back. |  |  |  |

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| **Description of activity:**  A dry round-bottomed flask is filled with ammonia gas. Keeping the flask inverted, a 2-hole bung is put in the flask: 1 hole has a glass tube in, drawn into a jet that is positioned near the middle of the flask. The other hole has a syringe inserted into it with a few cm3 of cold water in.  A large beaker or other container is filled with water containing an acid/base indicator. The flask of ammonia is held over this container (probably by a clamp) ensuring the end of the tube is well below the surface.  A few cm3 of water are squirted from the syringe into the flask. The ammonia dissolved in this, creating a partial vacuum which draws more water, containing indicator, up the tube and through the jet into the flask, changing colour as it contacts the alkaline ammonia. This continues for some while (depending on the size of the flask and the jet) until the flask is almost filled with water. |

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| **Additional comments:**  Disposal  The contents of the flask can be washed down the sink in the fume cupboard with plenty of water. |