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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 | Distillation of Crude Oil |
| *Date of assessment* | 11th March 2019 |
| *Date of review (****Step 5****)* |  |
| *School* |  |
| *Department* |  |

| Step 1 | Step 2 | Step 3 | Step 4 | | |
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| *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* |
| Real crude oil contains benzene – a known human carcinogen |  | Do not use real crude oil – use a synthetic mix instead. |  |  |  |
| Many components of the mixture are Carcinogenic, Mutgenic and Specific Target Organ Toxins. | Demonstrator or pupils by skin contact | Use small quantities, with care and wear gloves and eye protection. |  |  |  |
| Many components of the mixture are also hazardous by inhalation | Demonstrator or pupils by inhalation of fumes. | Carry out in a fume cupboard or on a small scale in a well-ventilated laboratory.  Students should not inhale the fractions. |  |  |  |
| Many components of the mixture, especially the low boiling point ones, are highly flammable. | Demonstrator, pupil and audience by fire. | Heat the mixture carefully – especially at first. Keep the Bunsen flame well away from the delivery tube. |  |  |  |
| High boiling point fractions could condense in the delivery tube and block it, causing a pressure build up. | Demonstrator or pupils by pressure build up causing bung to be forced out (or possibly even tube to explode) | Make sure the delivery tube is a short as possible to still work and also not too narrow.  Keep an eye on it while heating to see if there are any signs of blockage. |  |  |  |

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| **Description of activity:**  An artificial crude oil mixture is distilled in a side-arm test tube with increasing temperature and the fractions coming over in different temperature ranges are collected and examined  *The recipe from CLEAPSS consists of mixing together in a glass bottle :-*   * *liquid paraffin (medicinal) (55 cm3),* * *paraffin oil (kerosene), (20 cm3),* * *white spirit (11 cm3),* * *petroleum spirit 100 to 120°C (4 cm3),* * *petroleum spirit 80 to 100°C (4 cm3),* * *petroleum spirit 60 to 80°C (6 cm3) and* * *a little black oil based paint to make the mixture black.  A squeeze from a tube of  Newton and Windsor’s Black Ivory oil paint is convenient.* * *Label the bottle Highly Flammable and Harmful, stopper and shake well.  Shake well before use.* |

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| **Additional comments:**  This experiment is best carried out as a teacher demonstration. However, if there is a good level of preparation and supervision then senior pupils could be allowed to do it themselves.  Make sure you use a borisilicate/pyrex side-arm test tube.  The mineral wool can be placed in a polythene bag which can be put in the waste.  Dilute any remaining liquid in soapy water and wash to waste with plenty of running water.  It will be extremely difficult if not impossible to get the test tube properly clean but it can be kept for the same experiment in the future.  Do not use a mercury thermometer for this activity. |