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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 | Belousov-Zhabotinskii reaction |
| *Date of assessment* | October 2016 |
| *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* |
| Potassium bromate is (and sodium bromated probably is) a carcinogen as well as being toxic if ingested and oxidizing. | Teacher/technician preparing solutions by inhalation or splashes. | Wear goggles (BS EN166 3) and gloves. Avoid raising dust. Keep away from combustible materials |  |  |  |
| Malonic acid and iron II sulphate are harmful and an irritant | Teacher/technician preparing solutions by inhalation or splashes. | Wear eye protection. Avoid raising dust. |  |  |  |
| 6M H2S04 is corrosive | Teacher/technician preparing/using solution by splashes. | Wear goggles (BS EN166 3) or a face shield for diluting concentrated acid and follow appropriate guidance. Wear goggles (BS EN166 3) when using solution. |  |  |  |
| 1,10 phenanthroline is toxic if ingested | Teacher/technician preparing solutions by inhalation or splashes. | Wear goggles (BS EN166 3) and gloves. Avoid raising dust. |  |  |  |
| Reaction mixture gives off bromine - during preparation only. | Teacher/technician or bystanders preparing solutions by inhalation | The amount of bromine released is small. Work in a well-ventilated laboratory or in a fume cupboard. |  |  |  |
| Reaction mixture is corrosive, due to sulphuric acid, and carcinogenic, due to the bromate. | Teacher/technician carrying out reaction or clearing away by splashes. | Wear goggles (BS EN 166 3) and gloves. |  |  |  |

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| **Description of activity:**  To carry out the demonstration place about 5 cm3 of the bromate in a beaker and add 1 cm3 each of the bromide, malonic acid and sulphuric acid..  The mixture will go yellow because of bromine production. Swirl the beaker until the yellow colour completely disappears. Then add 1 or 2 cm3of E (the ferroin indicator solution), and swirl to mix. Pour the mixture into a Petri dish.  Initially red in colour, let the solution stand. After a while, tiny blue spots will start to appear. Each spot will slowly expand, eventually producing a series of concentric rings. The reaction may continue for half an hour, or even longer. |

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| **Additional comments:**  This reaction looks particularly good when the pertri dish with the mixture is placed on an overhead projector and the image projected on a screen. |