

Scheme of Work (DC1 607)

Activity: Preparing D.E.S.S. (DMSO & EDTA salt solution)

Location: DC1 607

Personnel Involved: Staff

*Don P.P.E. – laboratory coat, gloves & goggles.

D.E.S.S. ingredients:

DMSO soln.

EDTA disodium salt

20% NaOH soln.

25% HCl soln.

NaCl crystals

Distilled water

Equipment:

Heat & stir device with magnet

1 & 2 litre glass beaker

250 & 50ml measuring cylinders

pH meter

Balance (to 2 decimal points)

Funnel

Squeeze bottle

Pipette

Large dessert spoon (for adding NaCl)

D.E.S.S. recipe (for 1 litre):

- Measure out 93.06g of EDTA disodium salt (Formula weight 372.24g) – for a 0.25Mol soln. Place a magnet in the glass beaker and place on the heat & stir device. Add 200ml of distilled water to the beaker, set the temperature for 30°C and the magnet to stir. Add the EDTA salt to the beaker. *N.B. for EDTA salt with a different FW you will need to recalculate.*
- The EDTA salt solution will be in the region of 3-4pH. Quickly add 60ml of NaOH; the alkalinity will peak at over 13 but steady off at a pH of about 9 as the EDTA dissolves. *Raising the alkalinity quickly will assist in dissolving of the EDTA salt as does heating to 30°C.*
- Once the EDTA salt is dissolved, reduce the pH to 7.5 using about 20ml of HCl (adjust with pipette near the end) and top the volume up to 800ml with distilled water.
- Make up 20% DMSO by adding 40ml of DMSO to 160ml of distilled water (*note that the measuring cylinder will warm due to a chemical reaction), add to the beaker and continue stirring.
- Transfer the solution to a 1 litre measuring cylinder and top up if necessary and transfer to a 2 litre beaker back on the heat and stir.
- Add NaCl crystals till saturation is achieved; at least a centimetre of undissolved salt should be sitting on the bottom of the beaker to ensure this. Pour the solution into a container through a 45 micron sieve leaving most of the un-dissolved salt crystals in the beaker.
- Rinse all equipment into the D.E.S.S. waste bottle and rinse/wash thoroughly.

Other quantities:

	250ml	1l	2l	25l
DMSO/dH ₂ O	10:40ml	40:160ml	80:320ml	1:4 litres
EDTA salt	23.265g	93.06g	186.12g	2.3265kg
20% NaOH	~ 15ml	~ 60ml	~ 120ml	~ 1.5 litres
25% HCl	~ 5ml	~ 20ml	~ 40ml	~ 0.5 litres
NaCl salt	~60g	~ 250g	~ 500g	~ 6 kg