Preparation of SST from commercially available acid powder

The commercially available Sodium Silicotungstate (ie from Agar and most other UK suppliers) is actually in the acid form: Sodium Silico Tungstic Acid. This has a pH below 4 and does not work well as a negative stain. You can make a solution and just neutralise with conc. NaOH, but you have to add quite a lot and you are then not sure of the concentration of your stain, so I prefer to make a large batch and precipitate out the salt to use at a later date:

1.Take about 25g of Sodium Silico Tungstic Acid, add 20mls water and cool on ice.

2. Add conc NaOH (at least 5M) until pH is stable at pH7. The pH will rise as the NaOH is added but will then drop so you have to keep adding NaOH until the pH doesn’t drop below 7. You have to add a lot!

3. Cool on ice again.

4. Add cold ethanol to the solution. You will see a white precipitate that forms as you add the ethanol. Keep adding ethanol, until no more precipitate is formed, or when you have added about an equal volume of ethanol. Leave in the fridge overnight. The precipitate should mostly settle, and may stick to the sides and bottom of the beaker.

5. Filter the solution (using a vacuum pump and flask) and scrape off the precipitate stuck to the beaker. Wash with cold ethanol.

6. Allow the precipitate to dry. This is now Sodium Silicotungstate and you should have somewhere between 5-10g. Store in a dark container to prevent exposure to the light. (Not sure why, but that’s what the original method said so that’s what I do).

7. Make a 1% solution in water and use as your negative stain.