How to precipitate DNA with sodioum acetate?

Precipitating DNA with sodium acetate and ethanol is a common technique for concentrating or purifying DNA samples. Here's a general guide:

Materials:

- Microcentrifuge tube
- Your DNA sample
- 3M sodium acetate, pH 5.2 (or prepare according to a protocol if not readily available)
- 100% ethanol (preferably pre-chilled to -20°C)
- Optional: Linear acrylamide or glycogen (as a carrier for low DNA concentrations)
- Centrifuge

Procedure:

1. **Transfer your DNA sample to a microcentrifuge tube.** You can adjust the volume with distilled water if necessary (usually to reach around 200 µl).
2. **Add sodium acetate.** Use a volume equal to one-tenth (1/10) the volume of your DNA sample. This creates the right conditions for precipitation.
3. **(Optional) Add a carrier.** If your DNA concentration is low or the fragments are small (less than 100 nucleotides), consider adding 2 µl of linear acrylamide or glycogen to improve yield.
4. **Add ethanol.** Use a volume 2.5 times the original volume of your DNA sample. Ensure the ethanol is ice-cold for optimal precipitation.
5. **Mix well by gently inverting the tube several times.** Avoid creating bubbles.
6. **Incubate the mixture.** Place the tube in a freezer at -20°C for at least 30 minutes. Longer incubation (up to overnight) can improve yield, especially for low DNA concentrations.
7. **Centrifuge the mixture.** Use a microcentrifuge at high speed (around 14,000 x g) for 15 minutes at 4°C. This will pellet the DNA at the bottom of the tube.
8. **Carefully remove the supernatant (liquid) without disturbing the pellet.** You can use a pipette to remove most of the liquid, then aspirate any remaining liquid with a fine-tipped tip.
9. **(Optional) Wash the pellet.** Add 70% ethanol (room temperature) to the tube, resuspend the pellet by gently flicking the tube, then centrifuge again for 5 minutes at 4°C. Discard the supernatant. Repeat the wash step if desired.
10. **Air-dry the pellet.** Briefly invert the tube on a clean paper towel to remove any remaining ethanol. Be careful not to over-dry, as this can make the DNA difficult to resuspend.
11. **Resuspend the DNA pellet** in a desired volume of TE buffer (Tris-EDTA buffer) or distilled water for downstream applications.

Here are some additional tips:

- Wear gloves and safety glasses when working with chemicals.

- Work efficiently to keep the DNA and ethanol cold throughout the process.
- Be gentle when handling the pellet to avoid shearing the DNA.
- Adjust the volumes based on your specific sample volume.

For detailed information and variations in the protocol, consult a scientific reference or protocol from a reputable source.