Ammonium salts

Substance	Hazard	Comment
Ammonium chloride *Solid and concentrated solution* *(if 1.8 M or more)*	**HARMFUL**	WARNING: harmful if swallowed, causes serious eye irritation. It decomposes on heating to form ammonia gas (see *Sheet 30*) and hydrogen chloride gas (see *Sheet 20*) but they recombine on cooling. Warming with alkali will generate ammonia gas. Old name: sal ammoniac.
Ammonium chloride *Dilute solution (if less than 1.8 M)*	**Currently not classified as hazardous**	Warming with alkali will generate ammonia gas (see CLEAPSS Student Safety Sheet 30).
Ammonium sulfate(VI) *Solid and solutions*	**Currently not classified as hazardous**	It decomposes on heating to form ammonia gas (see *Sheet 30*) and sulfuric acid 'gas' (see *Sheet 22*) but they recombine on cooling. Warming with alkali will generate ammonia gas. It is an approved food additive, E517.
Ammonium carbonate *Solid and concentrated solution* *(if 1.0 M or more)*	**HARMFUL**	WARNING: harmful if swallowed. The solid decomposes, even at room temperature, to ammonia (see *Sheet 30*) and carbon dioxide (see *Sheet 58*). Warming with alkali generates ammonia gas. It is an approved food additive, E503. Old name: sal volatile; used as smelling salts.
Ammonium carbonate *Dilute solution (if less than 1.0 M)*	**Currently not classified as hazardous**	Warming with alkali generates ammonia gas (see *Sheet 30*).
Ammonium nitrate(V) *Solid*	**OXIDISING** **IRRITANT**	WARNING: oxidiser, causes serious eye irritation, may cause skin or respiratory irritation. It may decompose explosively if heated or on grinding; many industrial accidents have occurred in this way. Warming with alkali will generate ammonia gas (see *Sheet 30*).
Ammonium nitrate(V) *Solution*	**Currently not classified as hazardous**	The solution does have oxidising properties. Do not heat the solution to dryness. Warming with alkali will generate ammonia gas (see *Sheet 30*).
Ammonium dichromate(VI) – See *CLEAPSS Student Safety Sheet 47*.		

Typical control measures to reduce risk

- Wear eye protection.
- Do not heat solid ammonium nitrate(V) and do not heat ammonium nitrate(V) solution to dryness.
- Avoid exposure to hazardous decomposition products if ammonium carbonate, chloride or sulfate(VI) are heated, eg by using a fume cupboard.
- Avoid exposure to ammonia gas when reacting ammonium salts with alkalis, eg, by using a fume cupboard.

Assessing the risks

- What are the details of the activity to be undertaken? What are the hazards?
- What is the chance of something going wrong?
  eg specks of solid transferred into the eye by rubbing with a contaminated finger.
- How serious would it be if something did go wrong?
- How can the risk(s) be controlled for this activity?
  eg can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

In all emergency situations, alert the responsible adult immediately. Be aware that actions may include the following:

- In the eye — Irrigate the eye with gently-running tap water for at least 20 minutes. Call 999/111.
- In the mouth/swallowed — Do no more than rinse and spit with drinking water. Do **not** induce vomiting. Call 999/111.
- Spilt on the skin or clothing — Remove contaminated clothing. Irrigate the affected area with gently-running tap water for at least 20 minutes. Call 999/111 as appropriate. Rinse clothing.
- Spilt on the floor, bench, etc — Brush up solid spills, trying to avoid raising dust, then wipe with a damp cloth. Wipe up solution spills with a cloth and rinse it well.

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