

Explosions with Lithium

Sodium and potassium burn well, but hardly explosively, in air and it might be reasonable to expect lithium to be less violent. Indeed, the original Nuffield O-level course suggested heating lithium on asbestos paper as a pupil experiment (13.2a), although in the Revised course it has become a teacher demonstration (A13.2c, B16.4c). There are, however, a number of instances reported of lithium exploding violently¹ when heated on asbestos paper, crucible lids, etc. and a recent letter from a member suggests that the hazards of lithium are not as widely known as they should be. The late Alan Bullock investigated the reaction quite extensively² and concluded that explosions were especially likely in conditions of high humidity.

Whatever the cause, the conclusion is quite clear. Lithium is liable to react with explosive violence if heated on porcelain or similar materials. In the incident reported most recently, lithium heated on a crucible lid exploded with such violence that a piece of burning lithium landed on the fume cupboard window, and some hours later the glass shattered completely. Heating on metal combustion spoons appears to be safer, but in any case this should only be carried out as a teacher demonstration, on a small scale (1 mm pieces), with full safety precautions (eye protection, safety screens or fume cupboard, etc.)

References

1. Education in Science, January 1975 page 33.
2. The School Science Review, December 1975 page 311.