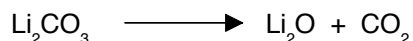


Chemguide – answers

GROUP 1: COMPOUNDS

1. a) lithium oxide and carbon dioxide.

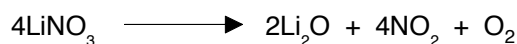


b) If you bring a positive ion close to the carbonate ion, the carbonate ion is polarised such that the negative charges tend to move onto the oxygen nearest to the positive ion. That means that you are on the way to getting an oxide ion formed. This effect is greatest if the positive ion has a high charge density.

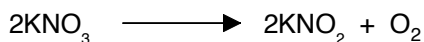
For positive ions with a single charge, the only thing which affects charge density is the size of the ion. Lithium ions are smaller than sodium ions – the same charge is packed into a smaller volume. Therefore lithium ions have more polarising effect on the carbonate ion than the bigger sodium ions. That means that you don't have to heat the lithium carbonate so much to complete the change to lithium carbonate and CO_2 .



2. a) lithium oxide, nitrogen dioxide (nitrogen(IV) oxide) and oxygen



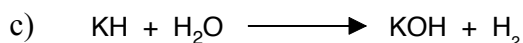
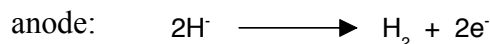
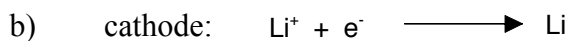
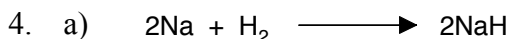
b) potassium nitrite and oxygen



c) The temperature needed to decompose the nitrates increases as you go down the group. As the positive ions get bigger they don't have as much polarising effect on the nitrate ions.

3. a) increases

b) increases



This is a good time to think about whether you are wasting potential marks by not writing accurate equations. Certainly in the UK, there aren't going to be a lot of marks for writing equations in exams at this level, but there will be a few, and you can't afford to waste them by making silly mistakes. The difference between the grade you want and one that doesn't get you where you want to be could be as little as 1 mark.

Chemguide – answers

You can't learn every equation that you might need – that would be a total waste of time. You have to be able to work them out, knowing the reactants and products. That means that you must be able to write accurate formulae, and balance equations efficiently.

If you are getting these equations wrong, do something about it – now! If you have a copy of my calculations book, do all the examples in chapter 1, and take particular care not to get formulae wrong. If you don't have a copy of my book, find some other way of practising this. If you get a trivial formula like lithium carbonate, for example, wrong, an examiner isn't going to be too impressed with you.

In an ideal world, it shouldn't matter elsewhere in an exam, but examiners are only human. If you have scattered your answers with chemically stupid mistakes, you aren't likely to get a “benefit of the doubt” mark in an explanation, for example, where what you have said is almost right but not quite clear. If your answers are generally accurate, you are much more likely to be allowed things like this.