

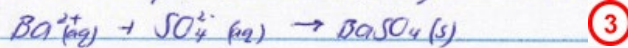
Sulfate (SO_4^{2-})

Tested with red litmus \rightarrow litmus stayed red/no change

Possible anions Cl^- , I^- , SO_4^{2-} , NO_3^-

Ruled out anions OH^- , CO_3^{2-}

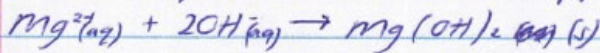
New sample add $\text{Ba}(\text{NO}_3)_2 \rightarrow$ white ppt occurred $\rightarrow \text{BaSO}_4$ (2)



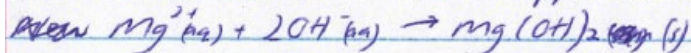
Solubility rule \rightarrow Most sulfates are soluble except for calcium sulfate, barium sulfate, and lead sulfate. Insoluble

Magnesium (Mg^{2+})

Add 2 drops $\text{NaOH} \rightarrow$ white ppt occurred $\rightarrow \text{Mg}(\text{OH})_2$ (3)



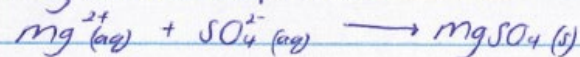
Add excess $\text{NaOH} \rightarrow$ white ppt remained. $\rightarrow \text{Mg}(\text{OH})_2$



New sample add dilute $\text{H}_2\text{SO}_4 \rightarrow$ white ppt disappear. (5)

Solubility rule \rightarrow All oxides, hydroxides are insoluble except those of group 1 and ammonium ion. Insoluble.

Magnesium Sulphate. (1)



Cows require magnesium^{ion} during winter and spring periods because cold weather means slowly grass growth and cow intake, there is a high demand for magnesium^{ion} over calving and lactation and low magnesium^{ion} levels in spring pasture.

Magnesium^{ion} deficiency in dairy cows occurs when cows are in late pregnancy and early lactation. High producing cows are more likely to lack ^{a higher amount of} magnesium^{ion} but all cows to some extent are deficient in magnesium^{ion} in the time period of late pregnancy and early lactation. Magnesium^{ion} assist with the production of hormones that help with absorption of calcium. Cows do store magnesium^{ion} in ^{their} body they are not able to access these. Therefore, cows only gain magnesium through their diet and supplements. It is recommended that dry cows have a diet containing 0.35% magnesium whereas lactating cows have a diet of 0.28% of magnesium. By giving cows either magnesium sulphate or magnesium chloride before calving ^{are} more likely to not get milk fever than using magnesium oxide. It can be difficult to supply the cows with enough magnesium sulphate or chloride so by using magnesium oxide as well means the cows will receive enough magnesium not just the correct type in small amounts. Magnesium^{ion} can be supplement to cows by a range of methods. Some are more effective than others and all depends

on the type of cow. Drenching is the most effective. All three of magnesium compounds (eg. magnesium sulphate, chloride, oxide) can be delivered in drenching. But although magnesium oxide is the cheapest it ~~is not~~ ^{is} is poorly soluble in water which can cause difficulty ~~to~~ with the drench. Next effective is pasture dusting. Pasture dusting only works with magnesium oxide. The required amount of magnesium oxide is doubled when applied because of the effect of wind and rain. Hay treatment once ~~again~~ ^{again} again only works with magnesium oxide. By applying a mixture of magnesium oxide to hay and being feed out to no more than 15 cows a bale. Can also be mixed with molasses to be more palatable. Next effective is through a water trough. This can be done with magnesium chloride and magnesium sulphate. This is a preferred option only if dusting and mixed in the feed/hay treatment is not possible. A dispenser is used and the trough needs to be monitored over a two to three week period time. Lastly are magnesium bullets. These only provide a small amount of magnesium^{ion} over a period of 9-12 weeks. This is not very effective as it does not reach the requirements that a cow needs during the ~~pre~~ late pregnancy and early lactation stage. If cows do not receive enough magnesium^{ion} then they ~~will~~ may develop milk fever also nervousness^{and excitability} in the cow. Whereas if a cow gets too much of magnesium^{ion} they become more lethargic and has a sedated effect. Also a lack of magnesium^{ion} can cause blood magnesium^{ion levels} to fall which can lead to one hypomagnesaemia. This can