Answer on Question#38672, Chemistry, Other

Apparently, the most appropriate and simple test to differentiate potassium carbonate from lithium sulfate is pH-test of water solutions of these salts.

Potassium carbonate (K_2CO_3) forms a strongly alkaline solution due to partial hydrolysis:

$$K_2CO_3 \text{ --> } 2K^+ + (CO_3)^{2-}$$
$$(CO_3)^{2-} + H_2O \text{ <-----> } (HCO_3)^- + OH^-$$

The alkalinity can be easy detected using reagent paper (litmus).

Conversely, pH of lithium sulfate (Li_2SO_4) will be closely to 7 (neutral) because no hydrolysis occur in this case. The salt will be dissociated only:

$$Li_2SO_4 \text{ --> } 2Li^+ + (SO_4)^{2-}$$