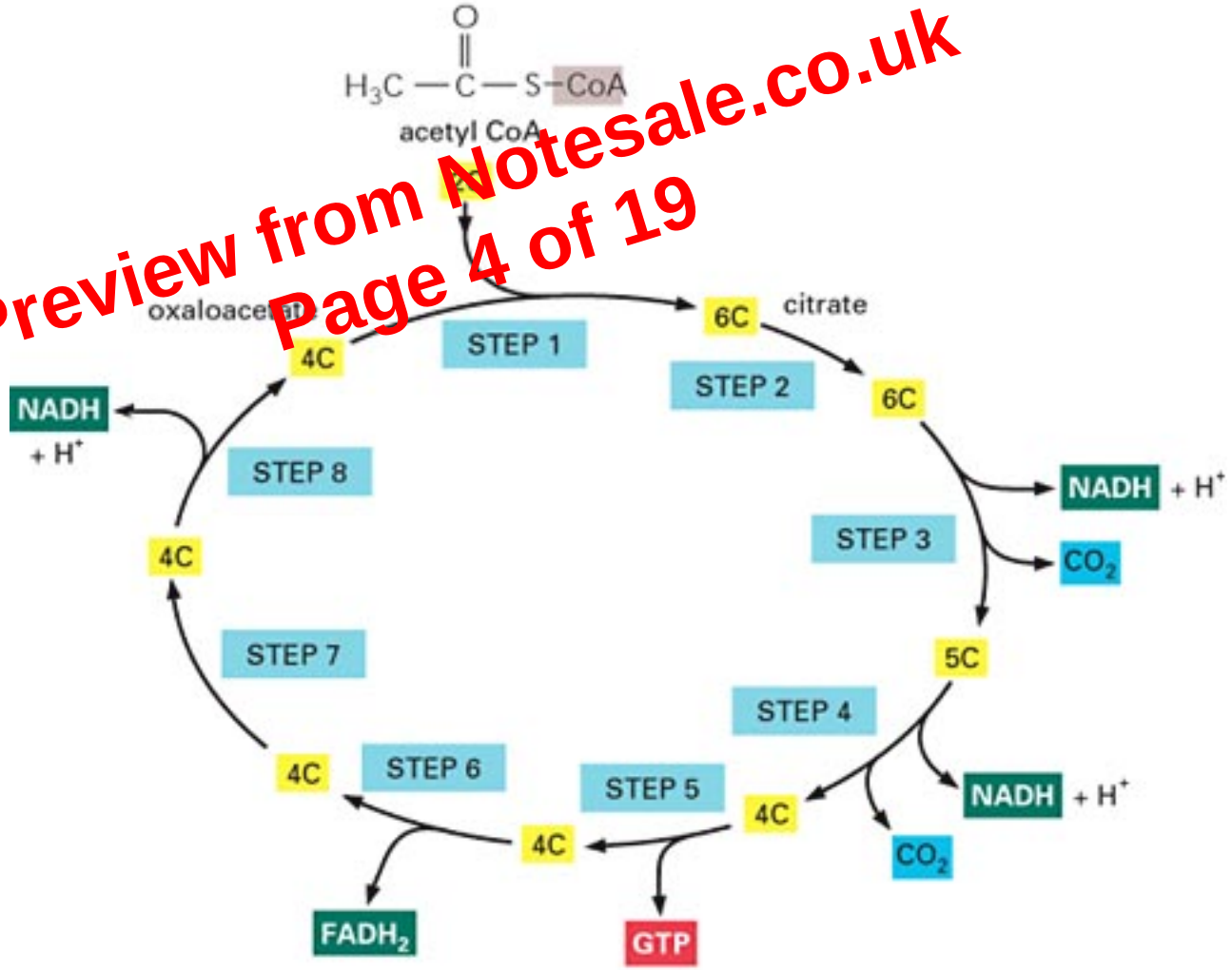
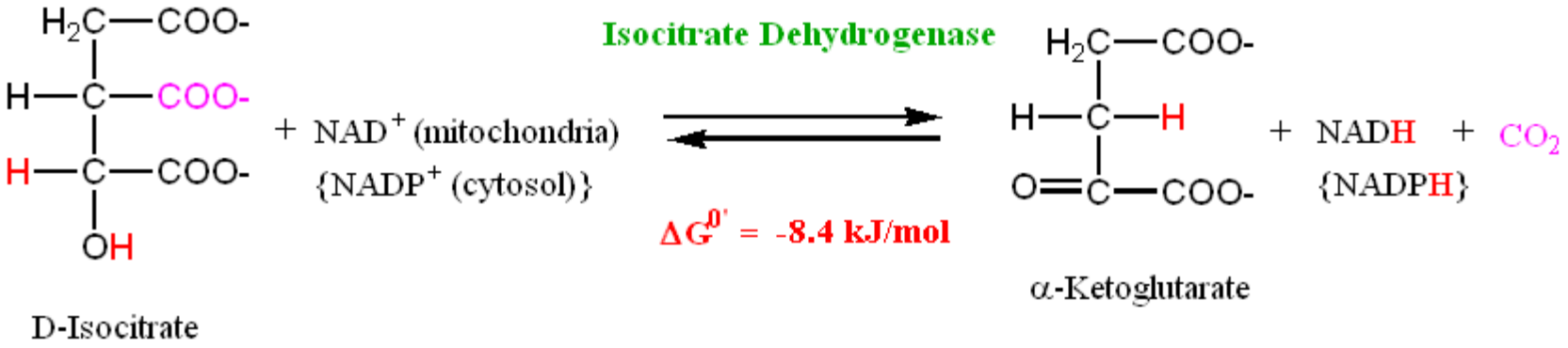


NET RESULT: ONE TURN OF THE CYCLE PRODUCES THREE NADH, ONE GTP, AND ONE $FADH_2$, AND RELEASES TWO MOLECULES OF CO_2

Step 3: Generation of CO_2 by an NAD+ linked enzyme

- The Krebs cycle contains two oxidative decarboxylation steps; this is the first one
- The reaction is catalyzed by the enzyme *Isocitrate dehydrogenase*



- The reaction involves dehydrogenation to *Oxalosuccinate*, an unstable intermediate which spontaneously decarboxylates to give *α-Ketoglutarate*
- The reaction is *exergonic*. This helps drive the preceding (endergonic) reaction in the cycle

Summary of Krebs cycle reactions up to this point

- Two carbons have been added to *Oxaloacetate* by the action of *Citrate Synthase* (and *Acetyl-CoA*)
- Two carbons have been lost as CO_2 by oxidative decarboxylation steps
- Two oxidized NAD^+ cofactors have been reduced to NADH
- Due to the stereospecific action of *Aconitase*, the two carbons added are *not* the same two carbons lost in the oxidative decarboxylation steps

In the remaining steps of the Krebs cycle, the Succinyl-CoA is converted back into the original substrate for the cycle: Oxaloacetate