TABLE 12.2   The enzymatic reactions of the citric acid cycle

Reaction	Enzyme
1. Acetyl CoA + Oxaloacetate + $H_2O \longrightarrow$ Citrate + HS-CoA + $H^{\oplus}$	Citrate synthase
2. Citrate $\rightleftharpoons$ Isocitrate	Aconitase (Aconitate hydratase)
3. Isocitrate + $NAD^{\oplus} \longrightarrow \alpha$-Ketoglutarate + NADH + CO_2	Isocitrate dehydrogenase
4. α-Ketoglutarate + HS-CoA + $NAD^{\oplus} \longrightarrow$ Succinyl CoA + N + ADH CO_2	α-Ketoglutarate dehydrogenase complex
5. Succinyl CoA + GDP(or ADP) + $P_i \rightleftharpoons$ Succinate + GTP(or ATP) + HS-CoA	Succinyl-CoAsynthetase
6. Succinate + Q $\rightleftharpoons$ Fumarate + QH_2	Succinate dehydrogenase complex
7. Fumarate + $_2HO \rightleftharpoons$ L-Malate	Fumarase (Fumarate hydratase)
8. L-Malate + $NAD^{\oplus} \rightleftharpoons$ Oxaloacetate + NADH + $H^{\oplus}$	Malate dehydrogenase

Net equation:

Acetyl CoA + 3 $NAD^{\oplus}$ + Q + GDP(or ADP) + P_i + 2 $H_2O \longrightarrow$ HS-CoA + 3 NADH + QH_2 + GTP(or ATP) + 2 CO_2 + 2 $H^{\oplus}$