Earth in Five Reactions
The Deep Carbon Observatory polled its community members about what they considered the five most important carbon-related reactions on Earth. These are the results:

1. **Hydrogenation | Dehydrogenation**
   \[ CH_4 + 2H_2O \rightleftharpoons CO_2 + 4H_2 \]

2. **Carboxylation | Decarboxylation**
   \[ 6CO_2 + 6H_2O \rightleftharpoons C_6H_{12}O_6 + 6O_2 \]

3. **Carbonation | Decarbonation**
   \[ CO_2 + CaSiO_3 \rightleftharpoons CaCO_3 + SiO_2 \]

4. **Carbon dioxide dissolution | Outgassing**
   \[ CO_2(aq) \rightleftharpoons CO_2(g) \]

5. **Hydration | Dehydration**
   \[ H_2O + CO_2 \rightleftharpoons H_2CO_3 \]
   \[ CO_2 + 18Mg_2SiO_4 + 6Fe_2SiO_4 + 26H_2O \rightleftharpoons CH_4 + 12Mg_3Si_2O_5(OH)_4 + 4Fe_3O_4 \]

**Runners-up**

**Redox freezing | Melting**
MgCO_3 + 2Fe \rightleftharpoons C + 3(Fe_{2/3}Mg_{1/3})O

**Metal silicate reaction**
C(metal) + 2FeO(silicate) \rightleftharpoons CO_2(silicate) + 2Fe(metal)

**Metal freezing | Melting**
FeC_x(l) \rightleftharpoons FeC_y(l) + Fe_7C_3, where y < x

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