It sublimes. Line A at 0.6 kPa (i.e. 600 Pa) crosses the solid/gas equilibrium line just below the triple point.

Line B on the phase diagram. Water is liquid in the range approx. 272 - 305 K.

There are 4 Fe atoms in the unit cell, 1 in the centre and \( \frac{1}{4} \) in the centre of each edge.
\[
1 + (12 \times \frac{1}{4}) = 4 \text{ Fe atoms per unit cell.}
\]
There are 4 O atoms in the unit cell, \( \frac{1}{8} \) at each corner and \( \frac{1}{2} \) in the centre of each face.
\[
(8 \times \frac{1}{8}) + (6 \times \frac{1}{2}) = 4 \text{ O atoms per unit cell. Ratio of Fe:O = 4:4. Therefore FeO.}
\]
Coordination number of each ion is 6.

\[
\text{Fe}^{2+} : \text{Fe}^{3+} = 1 : 2
\]

\( \text{Fe}^{2+} \) has 6 \textit{d} electrons, 4 are unpaired as shown below.

\[
\begin{array}{cccccc}
\uparrow & \downarrow & \uparrow & \uparrow & \uparrow & \uparrow \\
\end{array}
\]

\( \text{Fe}^{3+} \) has 5 unpaired \textit{d} electrons arranged in the 5 available \textit{d} orbitals as shown below.

\[
\begin{array}{cccccc}
\uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\
\end{array}
\]

Buffers contain a weak acid and its conjugate base. HCl is a strong acid and its conjugate base is Cl\(^-\), a very weak base. Any added H\(^+\) will decrease the pH as it doesn’t react with the Cl\(^-\). Any added OH\(^-\) will increase the pH as it reacts with the H\(^+\), not the weak acid as happens in the case of a buffer.

No. Buffers contain a weak acid and its conjugate base. HCl is a strong acid and its conjugate base is Cl\(^-\), a very weak base. Any added H\(^+\) will decrease the pH as it doesn’t react with the Cl\(^-\). Any added OH\(^-\) will increase the pH as it reacts with the H\(^+\), not the weak acid as happens in the case of a buffer.
2010-N-5
- 0.01 M
- $3 \times 10^{-17}$ M
- 100%

2010-N-6
- 2.7
- 100%
- 3 hours

2010-N-7
- 

2,4-dimethylpentan-2-ol NO REACTION
nucleophile electrophile tertiary (3°)
nucleophile electrophile quaternary (4°)

Priorities at *1: –NH₂ > –CONHR > –CH(CH₃)₂ > –H
With H at back these groups go anticlockwise. Therefore (S)- configuration about *1.

Priorities at *2: –NHCOR > –COOH > –(CH₂)₄NH₂ > –H
With H at front these groups go clockwise. Therefore, with H at back, they would go anticlockwise. Therefore (S)- configuration about *2.
The product absorbs strongly in the 1650-1800 cm\(^{-1}\) region. The intermediate alcohol absorbs strongly in the 3000-3300 cm\(^{-1}\) region. The starting material does not absorb strongly in either of these regions. The starting material is symmetrical and has only 2 resonances whilst the product has 4 resonances.

Add a solution of sodium hydrogencarbonate. The propionic acid will evolve lots of CO\(_2\) bubbles. There will be no reaction with the acetone.