



# 創造性の育成塾



江戸川学園取手中・高等学校  
兼 龍盛(かね りゅうせい)

原子の世界の

好き 嫌い !?



江戸川学園取手中・高等学校  
兼 龍盛(かね りゅうせい)

# ようこそ!! 実験室へ

わたし

わたし

➡ 私たちをふくめ、私たちの

いろいろな身の回りにあるものを

かたちづくっている「もの」

★ (原子・分子) は非常に小さい。

物質をかたちづくっている

「もの」(原子・分子)は、

数千万倍に拡大してようやく

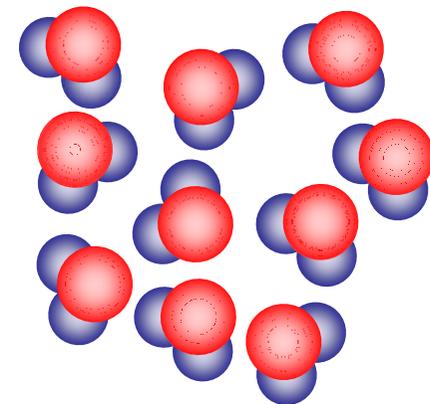
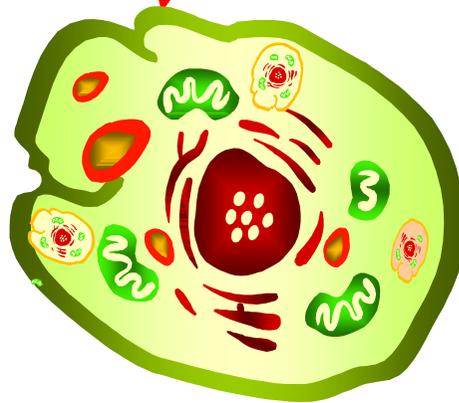
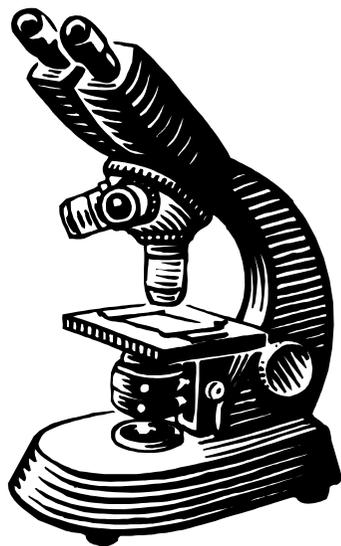
見えるようになる。



けんびきょう  
ふつうの顕微鏡では見るこ

せかい  
とができない世界だよ。

どうしたら、いいのだろうか？



細胞などは  
見ることができる

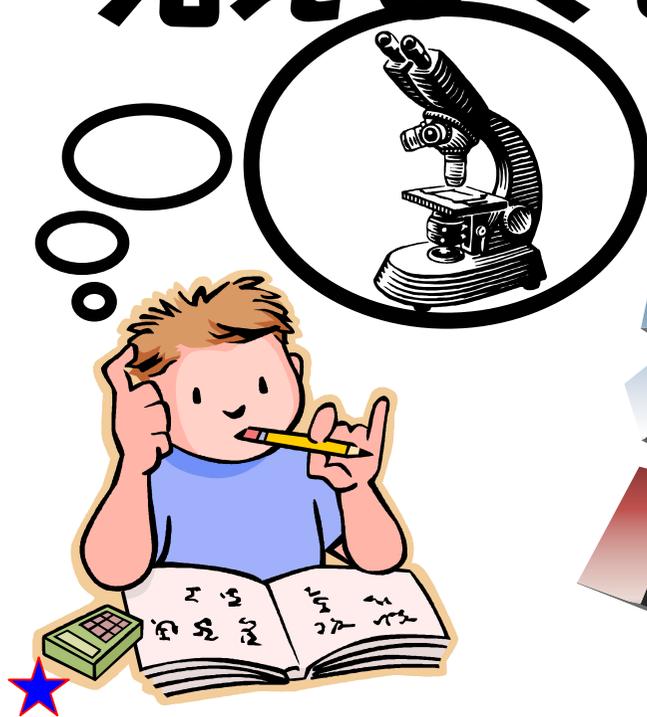
原子・分子の世界は  
見ることができない



きみ あたま なか こうせい  
でも君たちの頭の中の高性能

のう けんびきょう つか  
能の顕微鏡を使えば、きっと

み せかい  
見えてくる世界だよ。

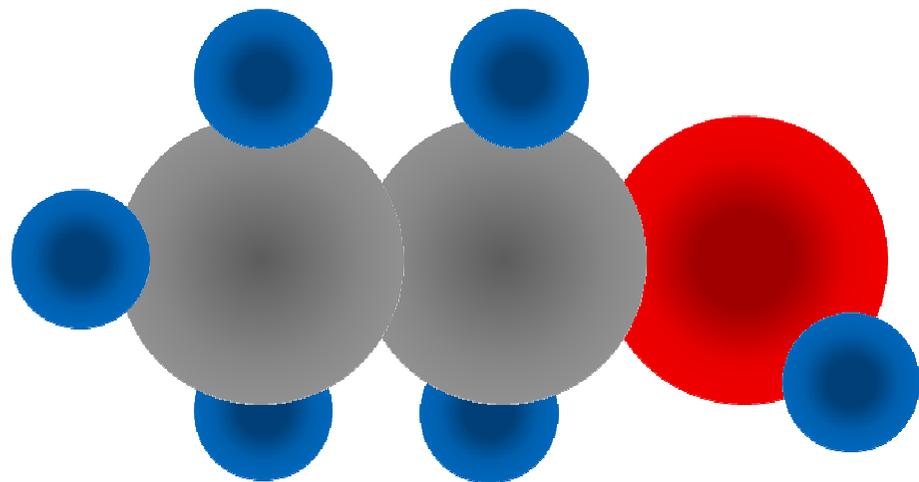
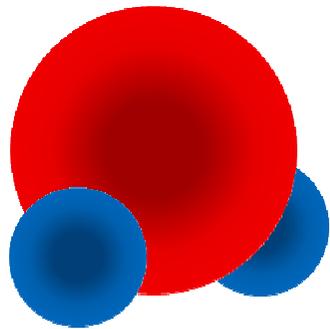


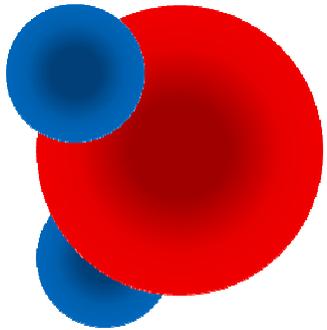
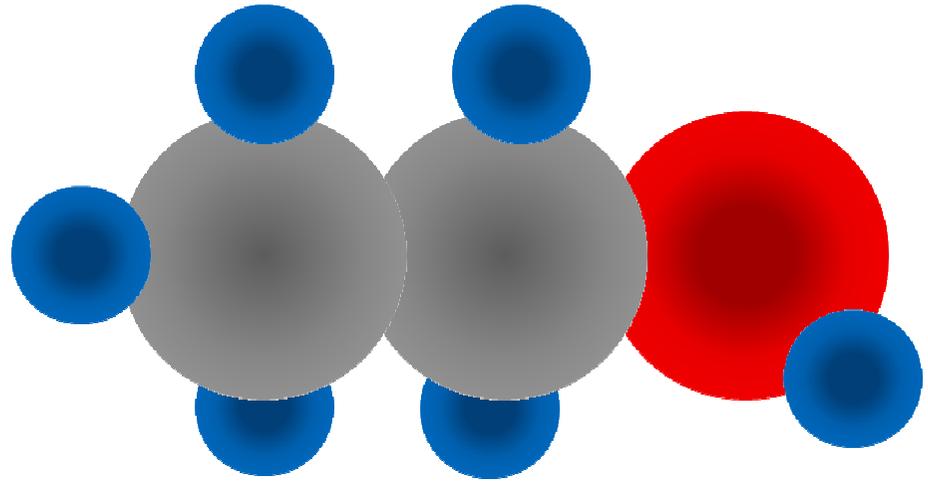
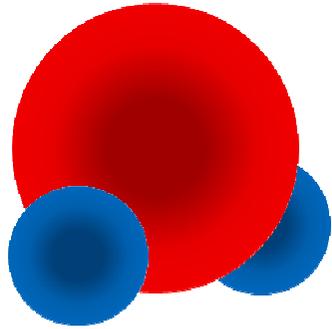
ちゅうちゅうりょく  
想像力

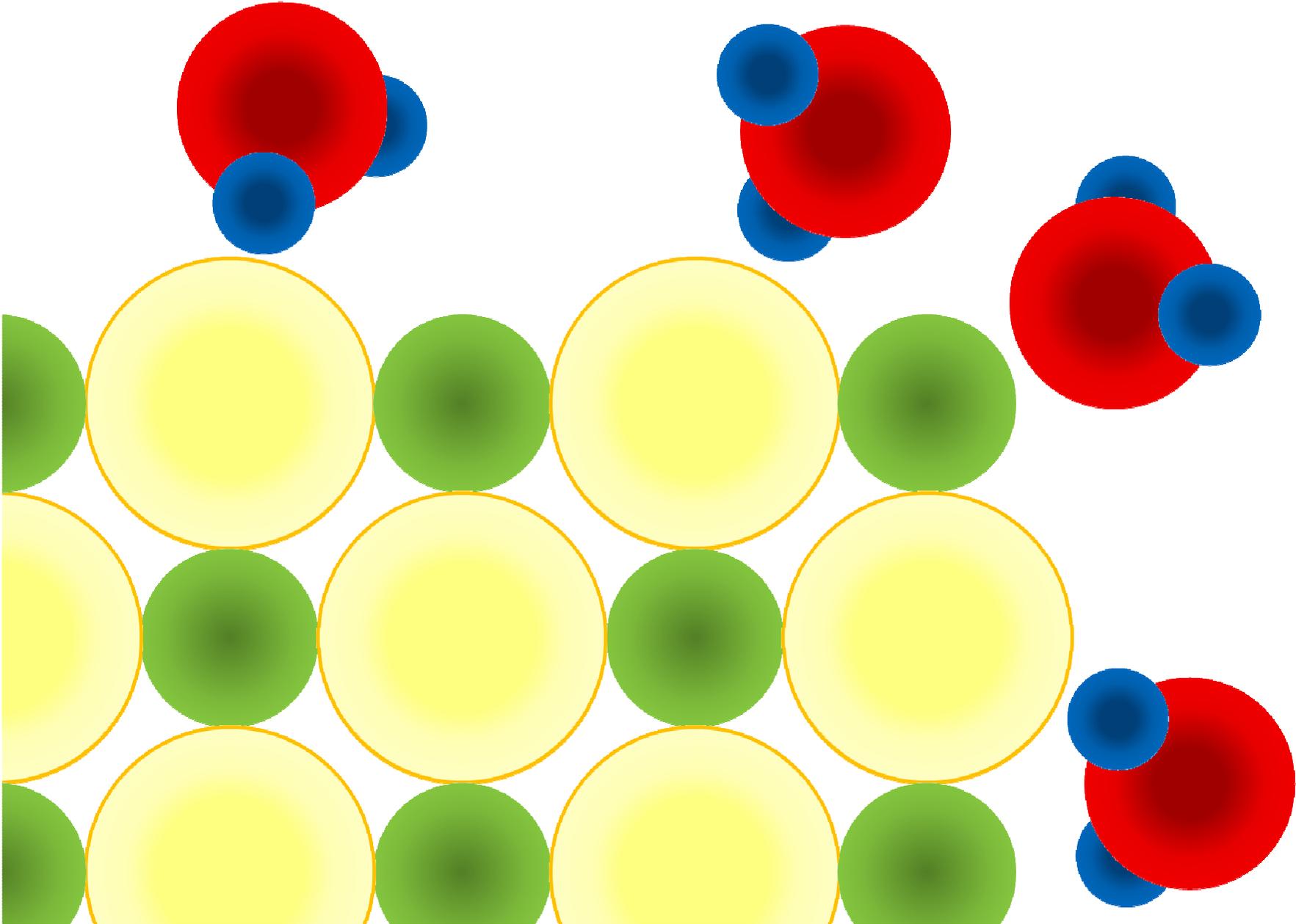
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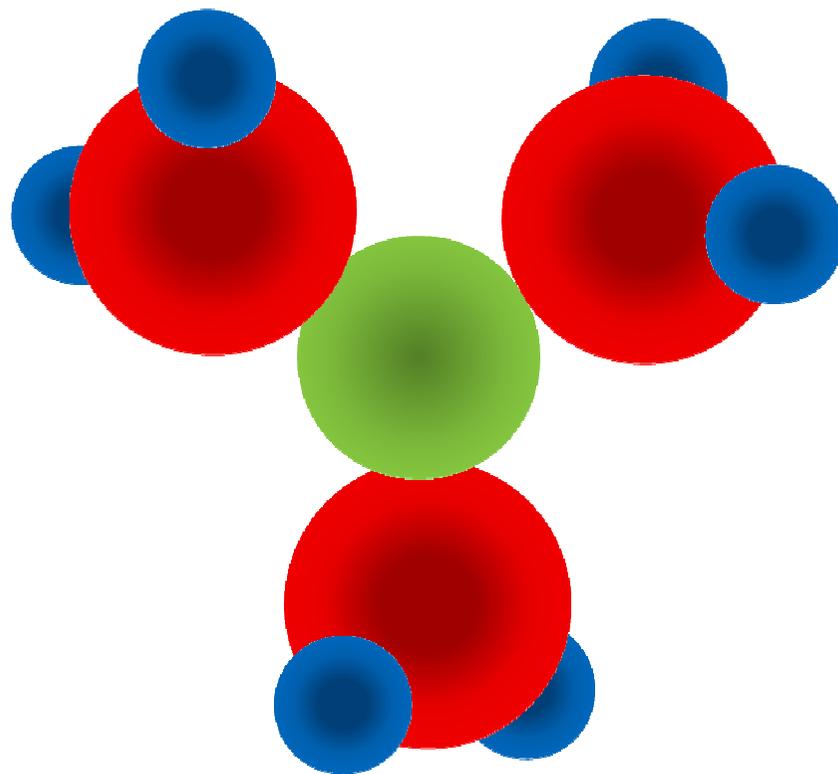
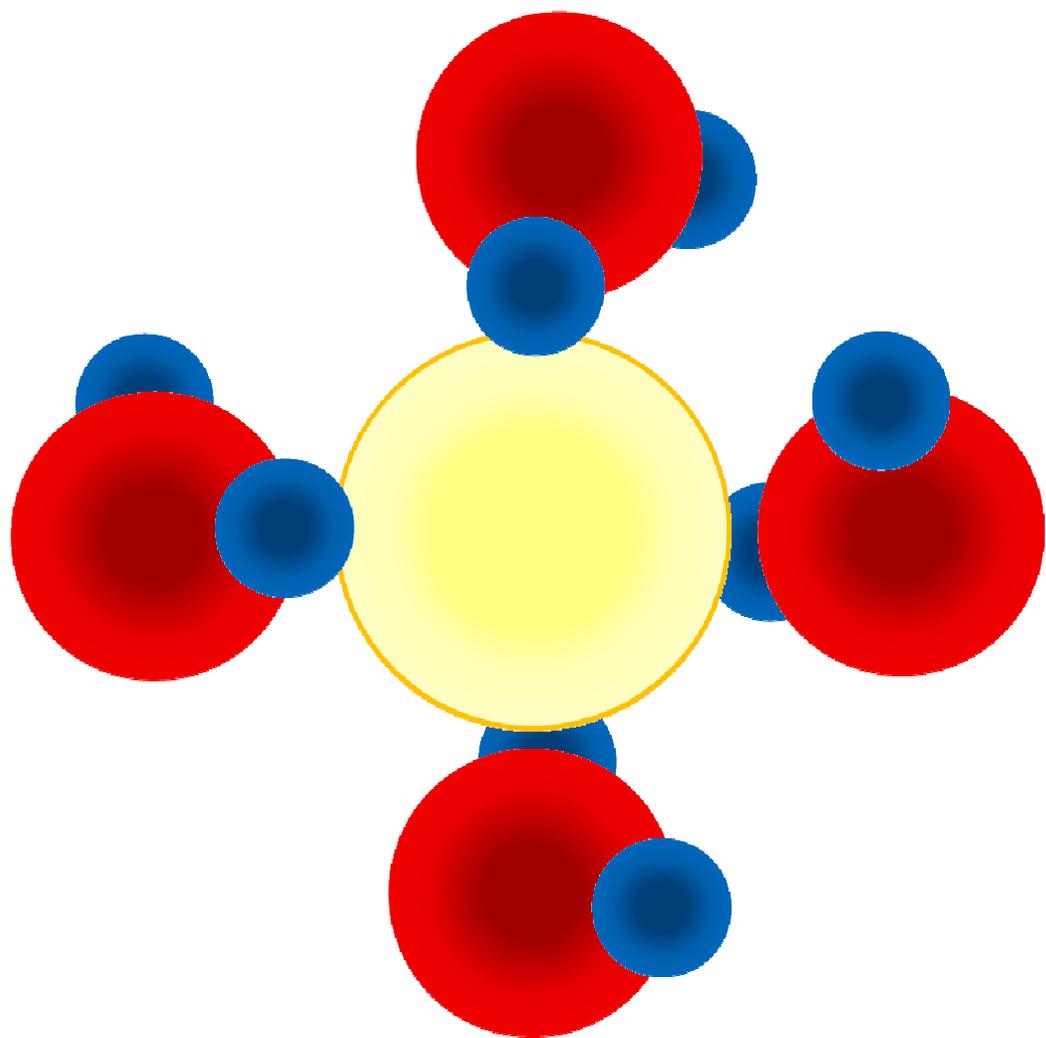


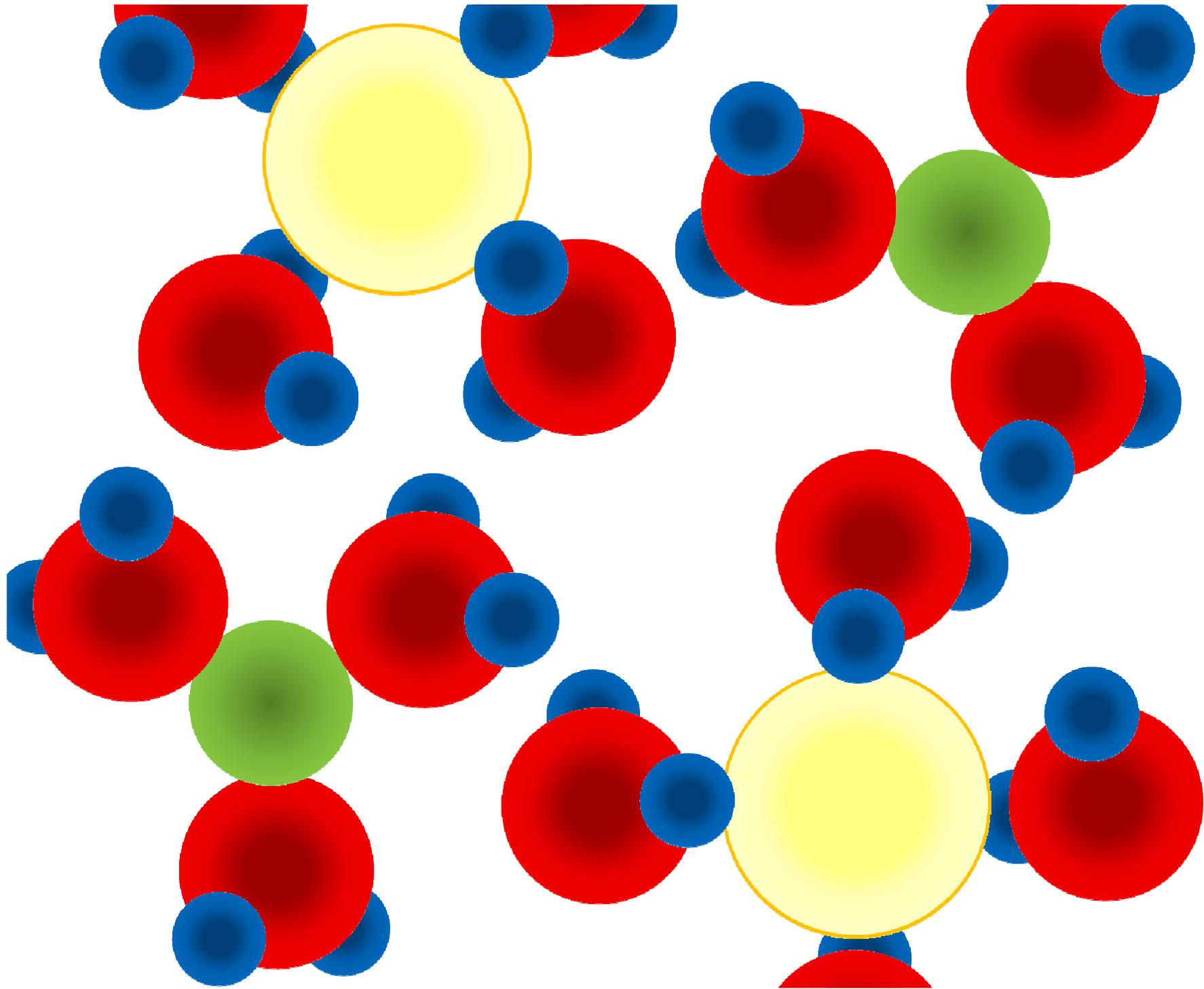
# 飽和食塩水に エタノールを加える

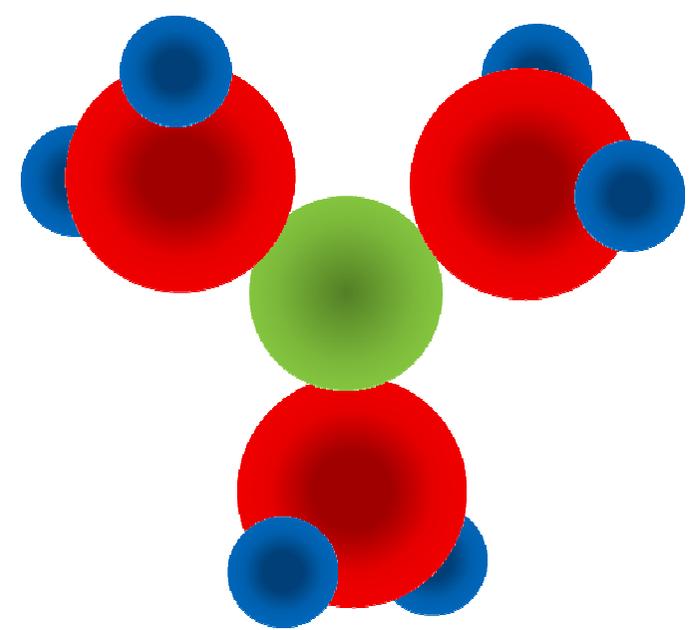
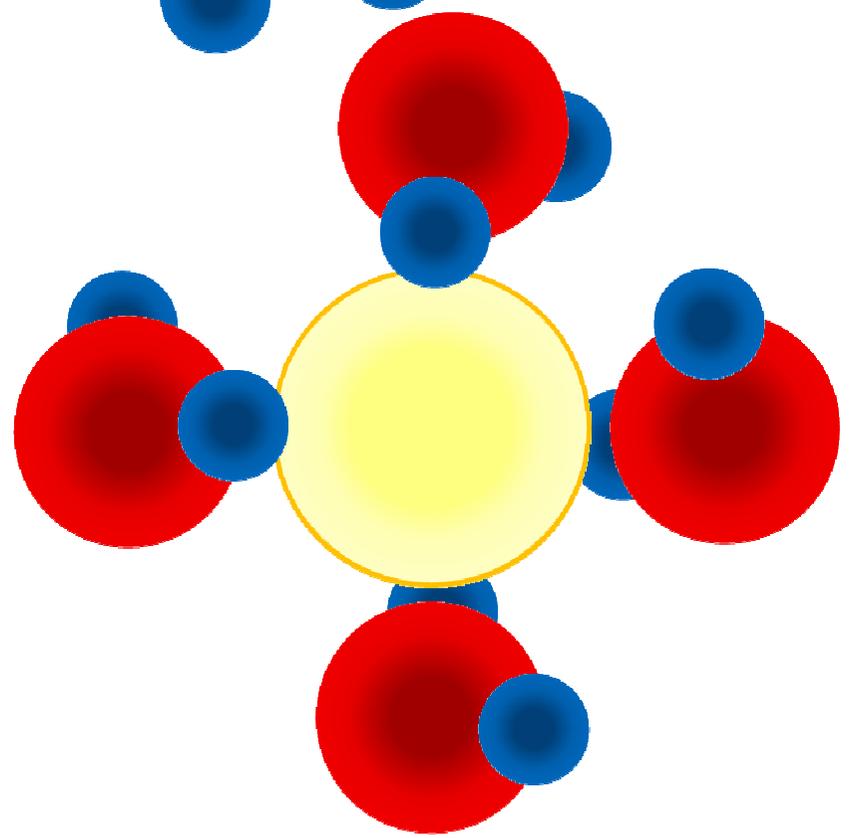
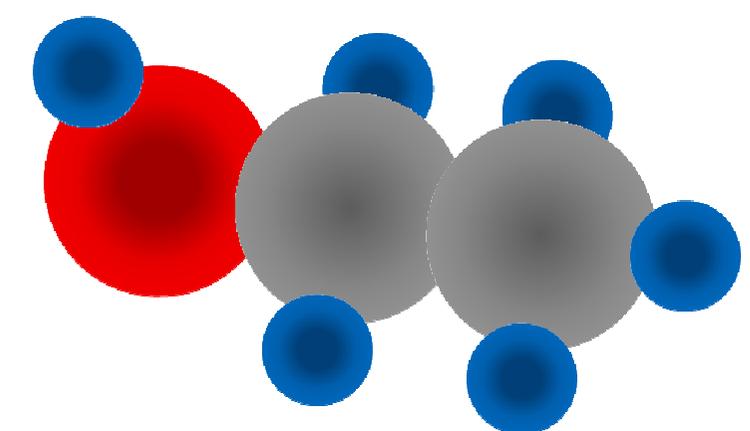
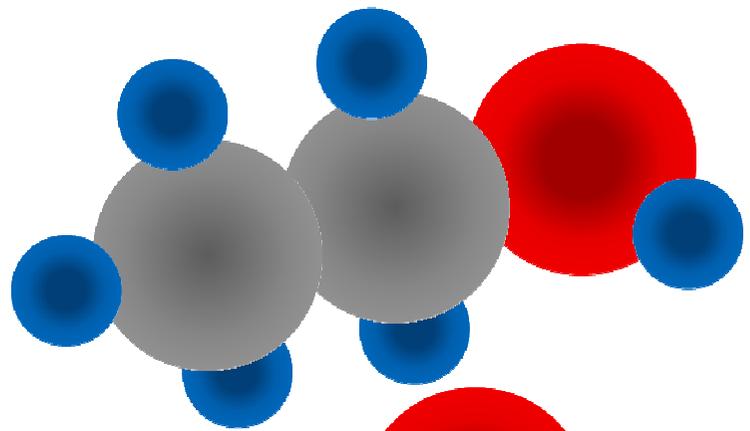


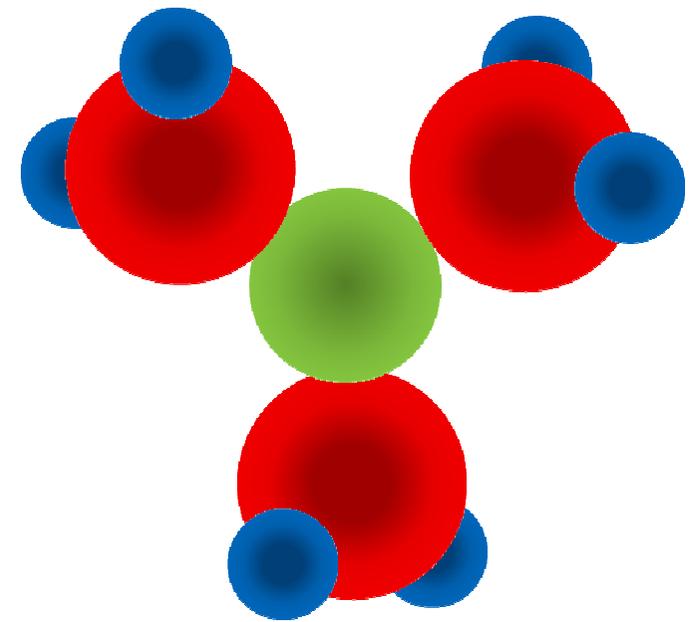
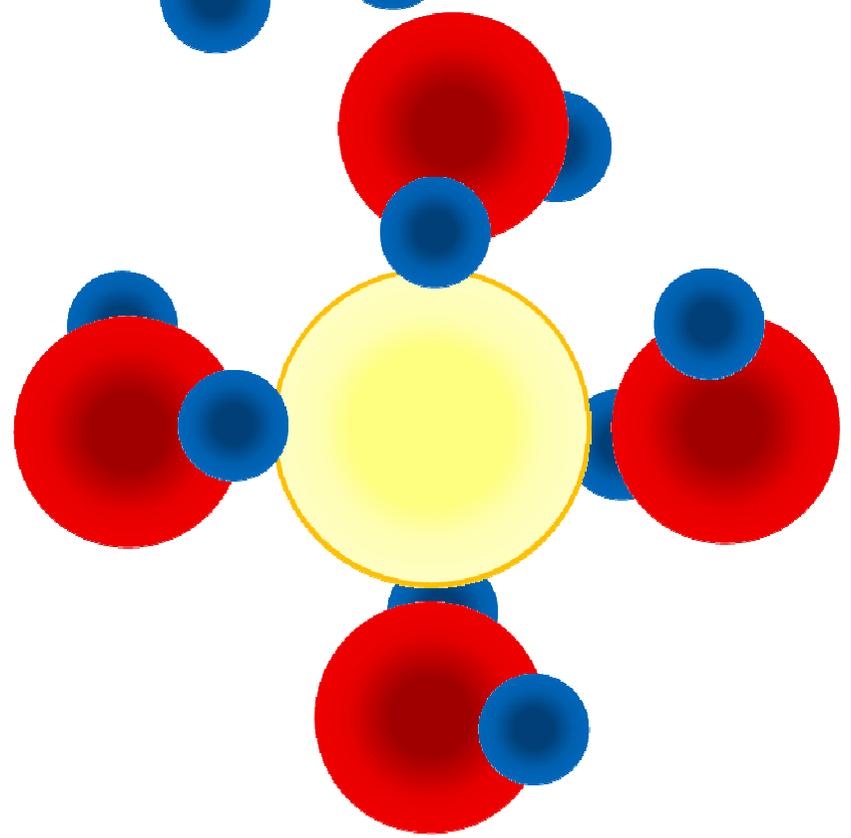
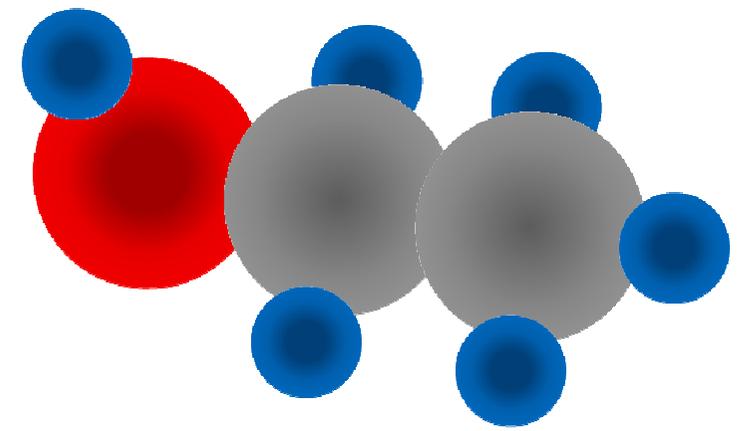
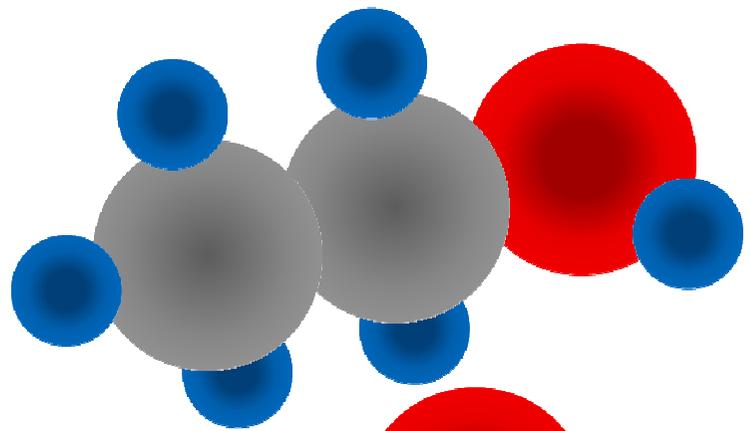




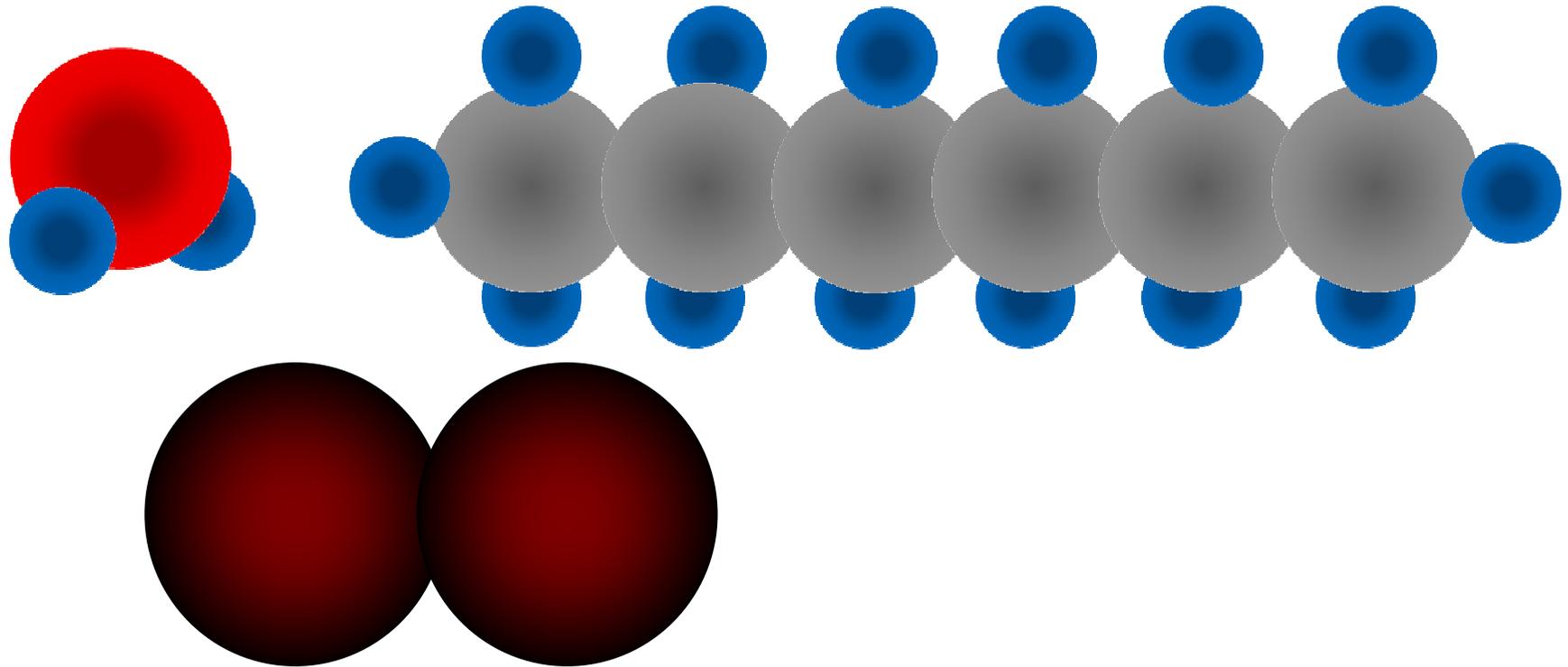




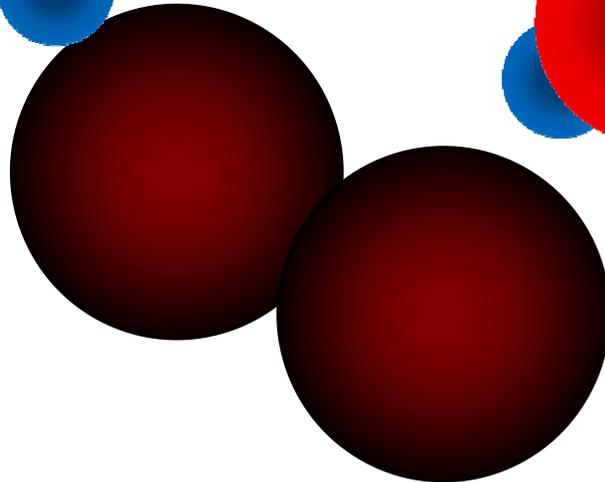
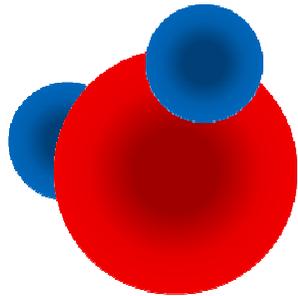
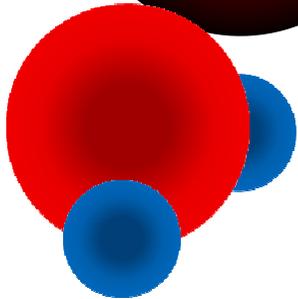
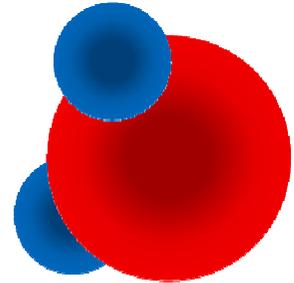
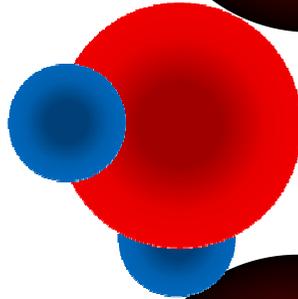
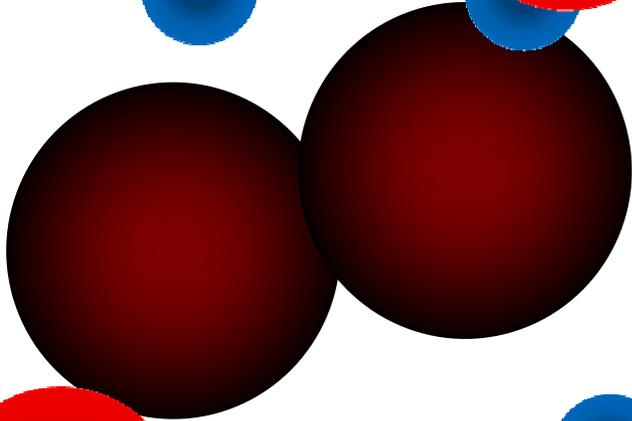
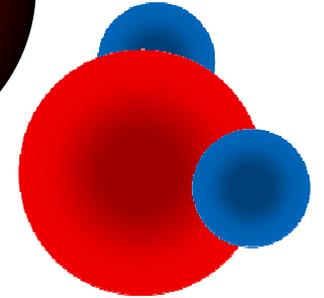
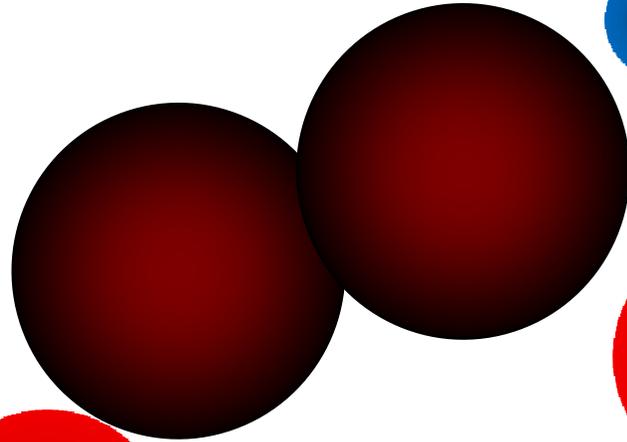
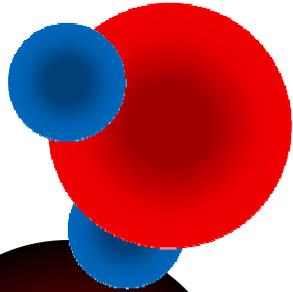
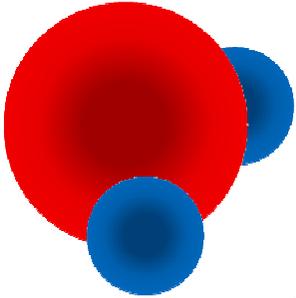
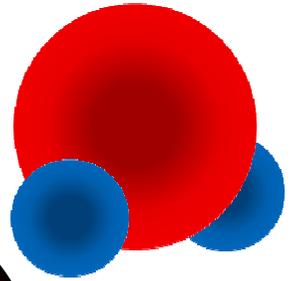
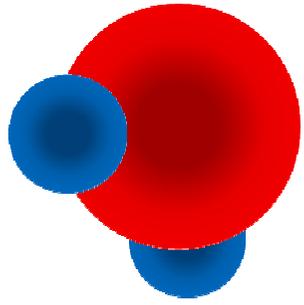


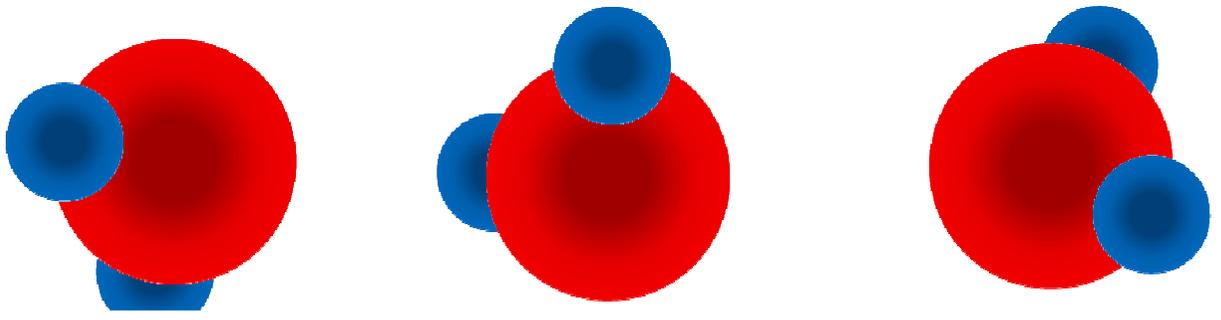
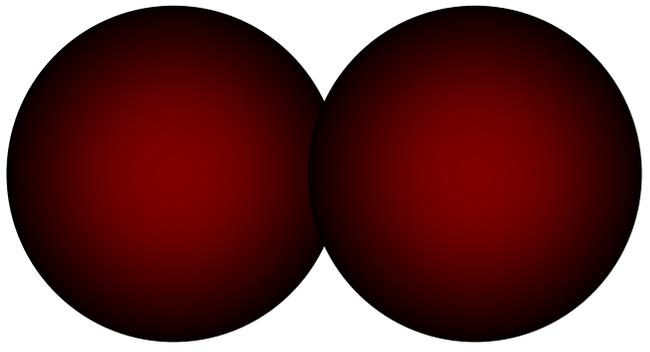
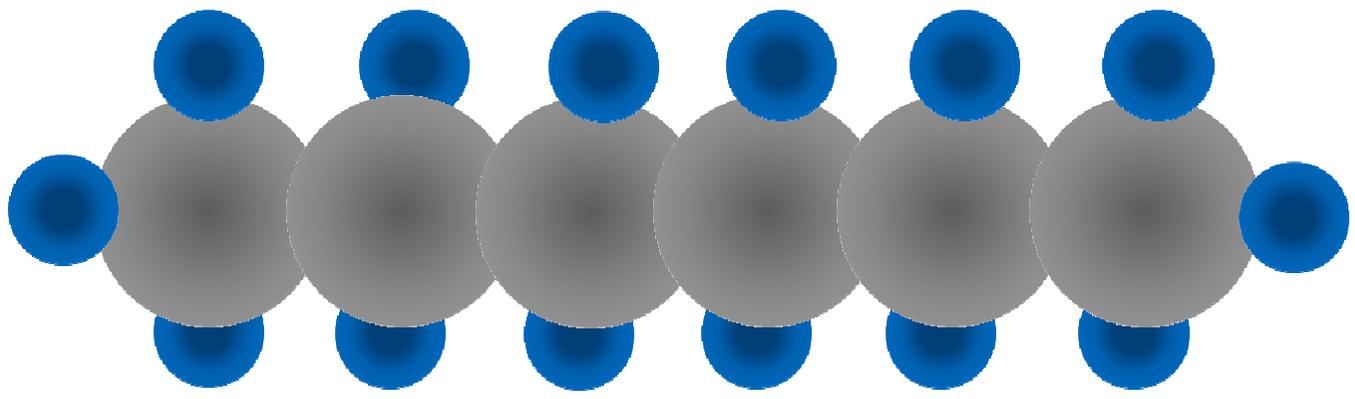


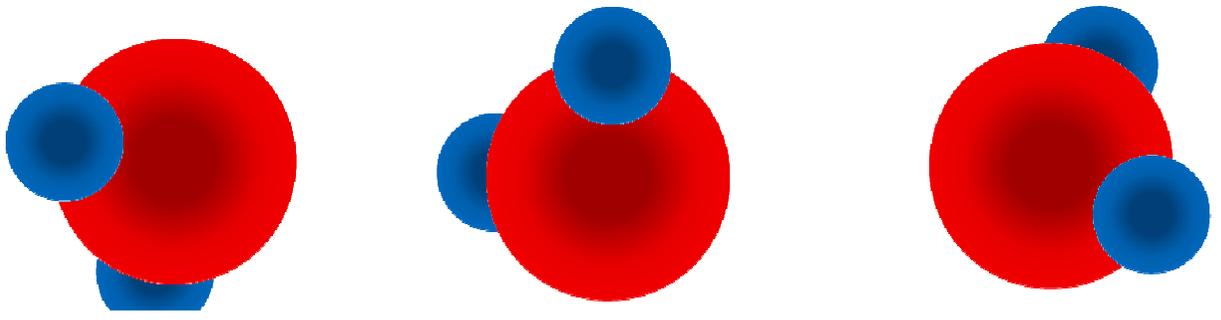
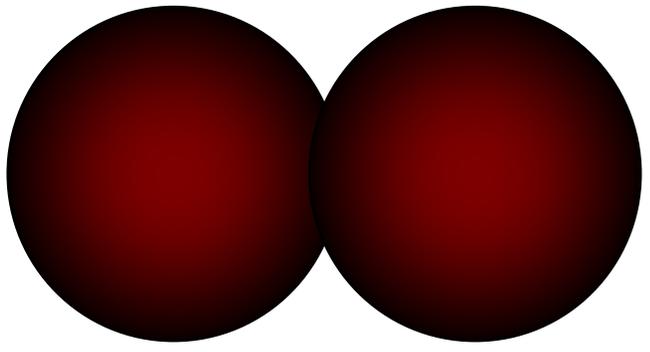
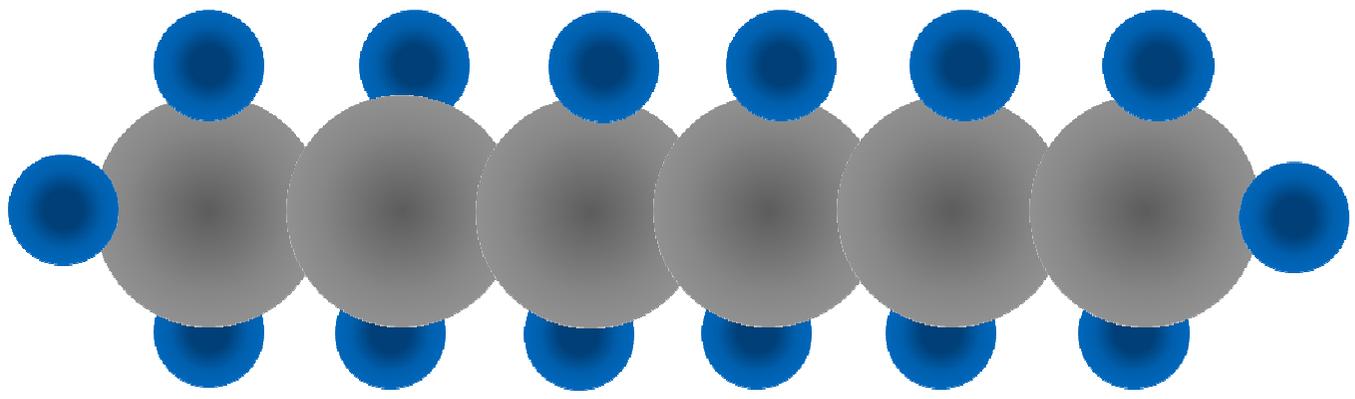
うがい薬に  
灯油(サラダ油)を加える



# うがい薬

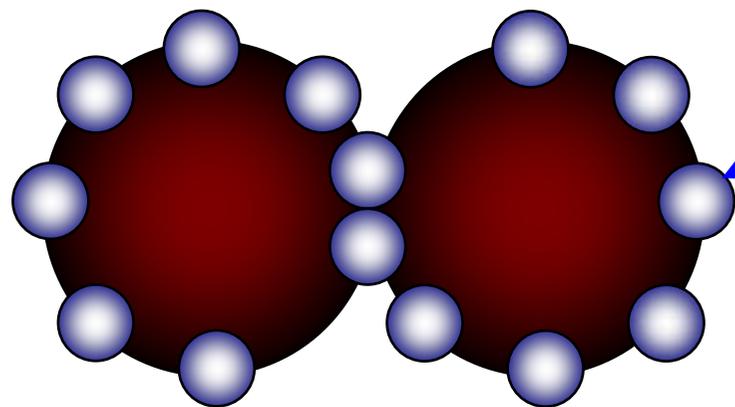








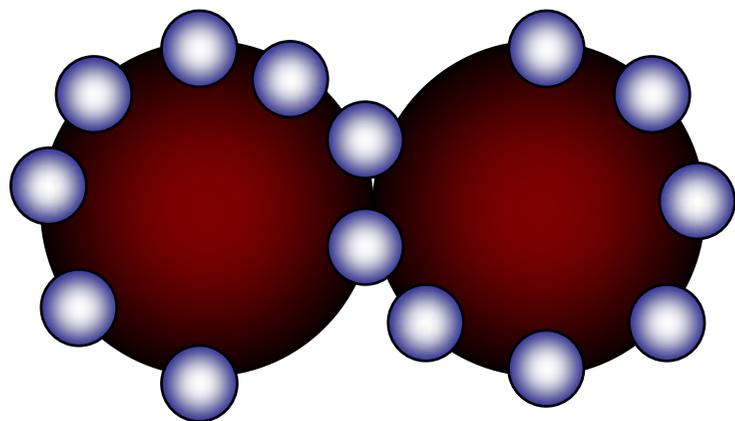
なぜ、色が消えたのか？



電子



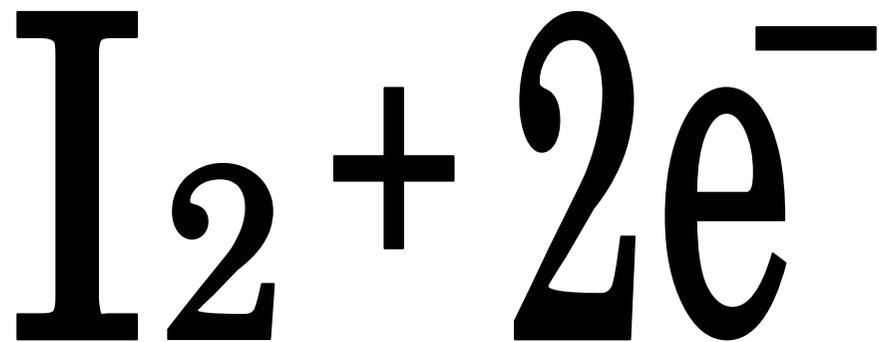
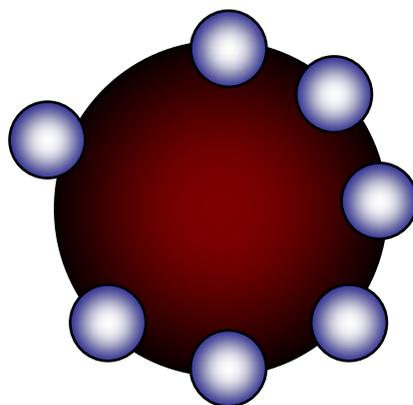
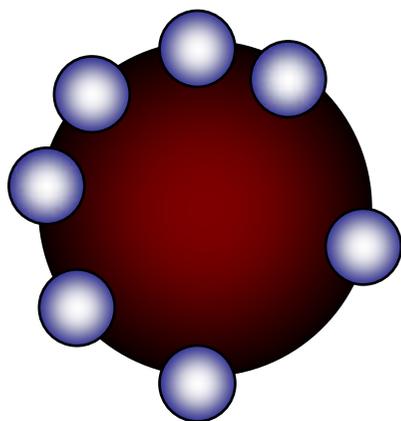
なぜ、色が消えたのか？



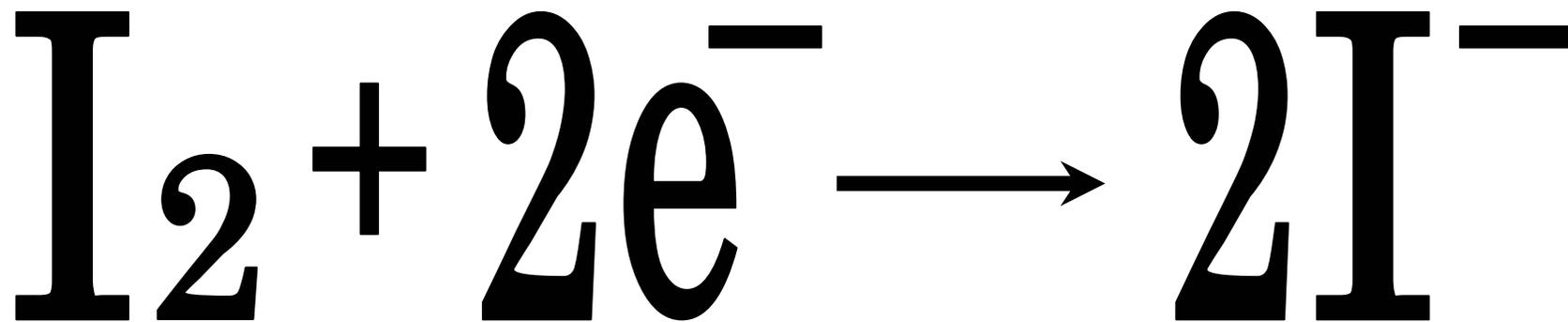
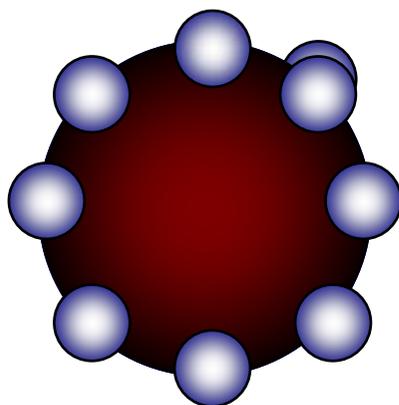
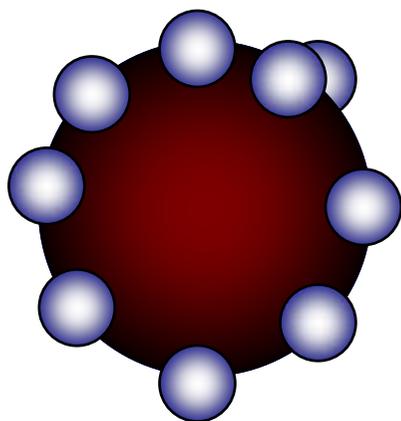
I<sub>2</sub>



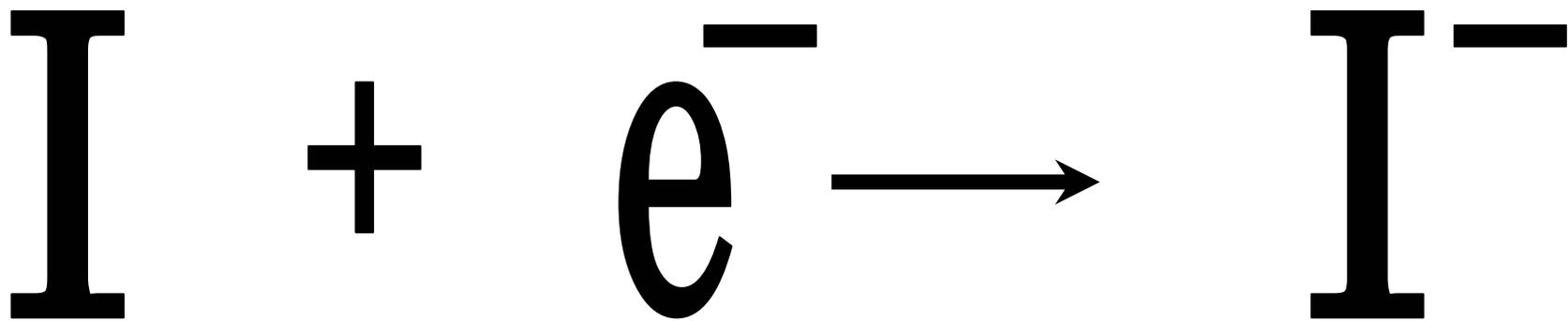
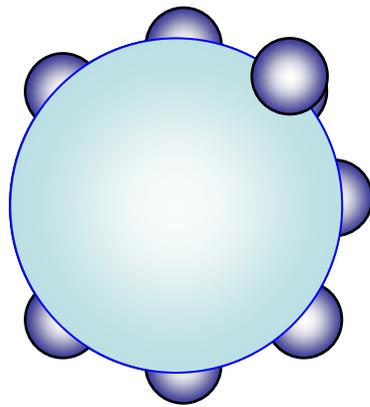
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なぜ、色が消えたのか？

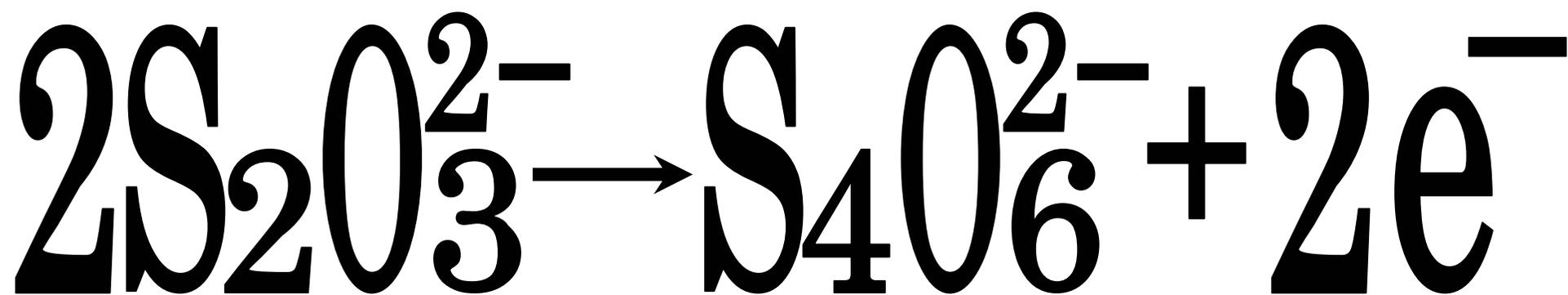


なぜ、色が消えたのか？

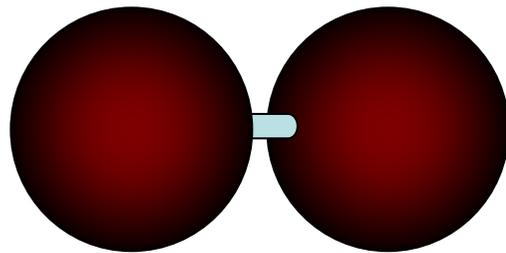
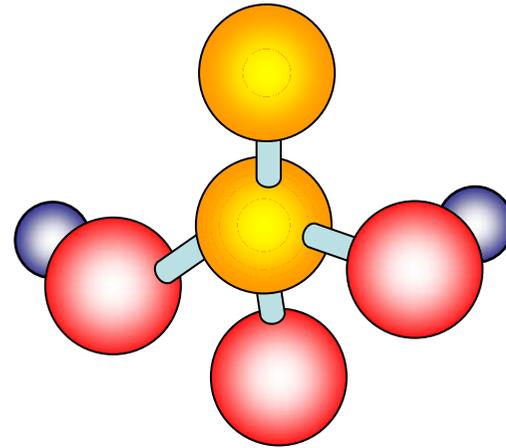
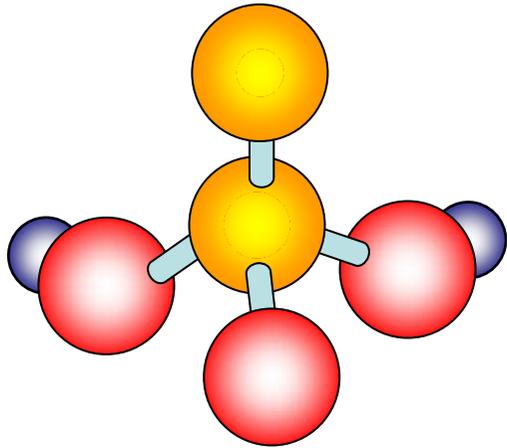


なぜ、色が消えたのか？

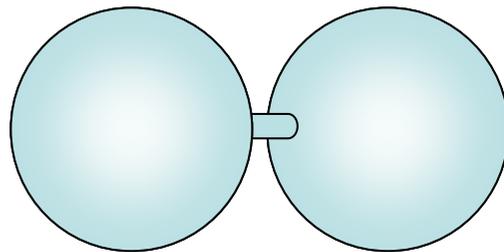
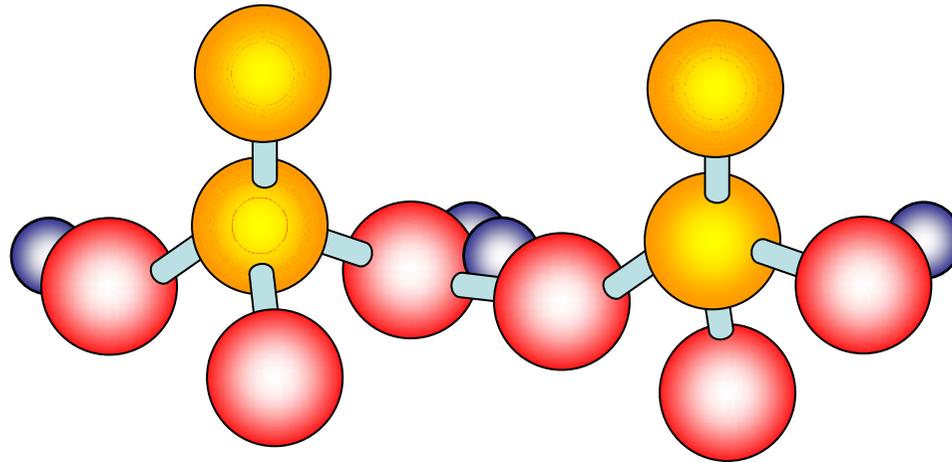
どこから電子がやってきたのか？



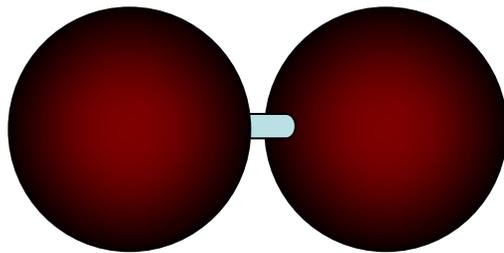
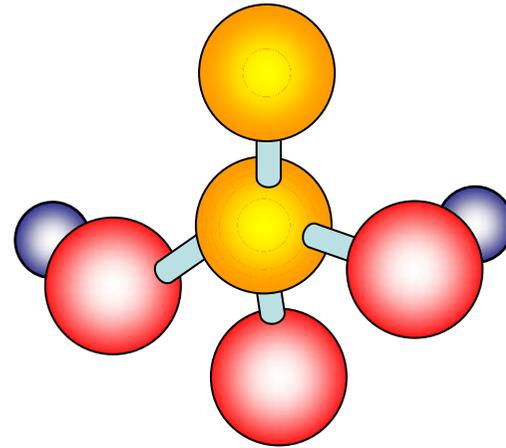
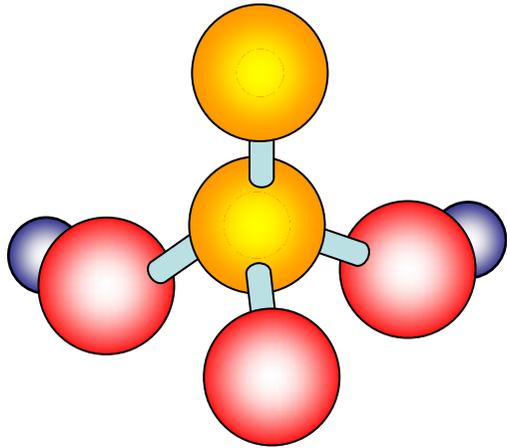
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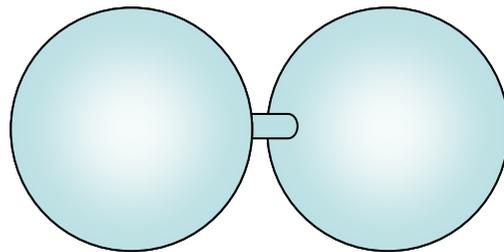
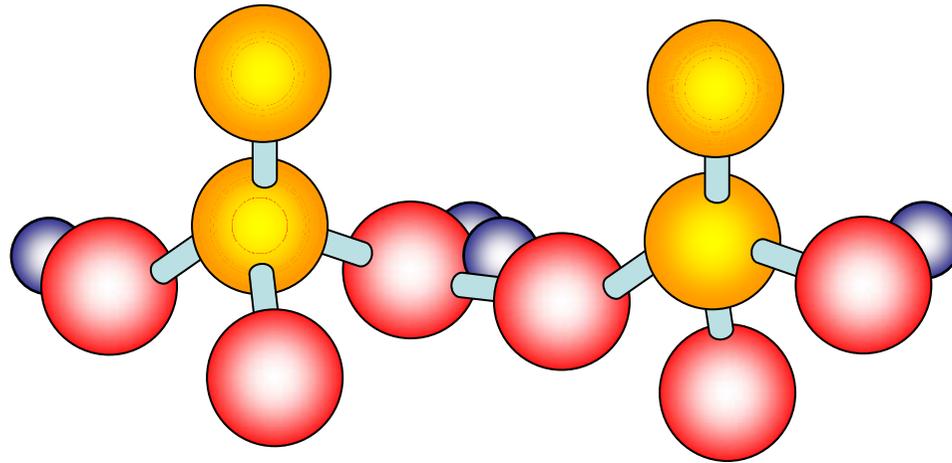
# なぜ、色が消えたのか？



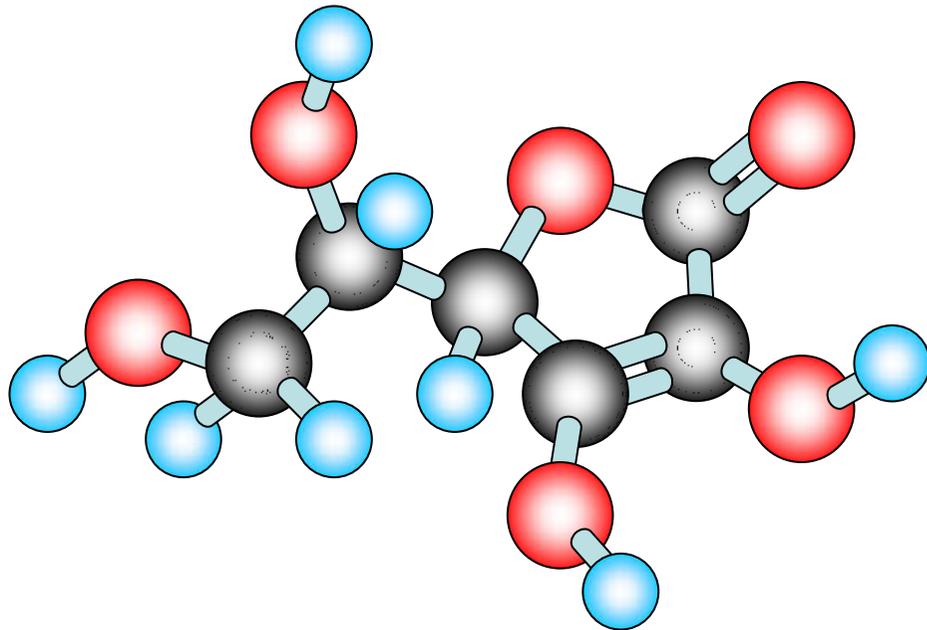
# なぜ、色が消えたのか？



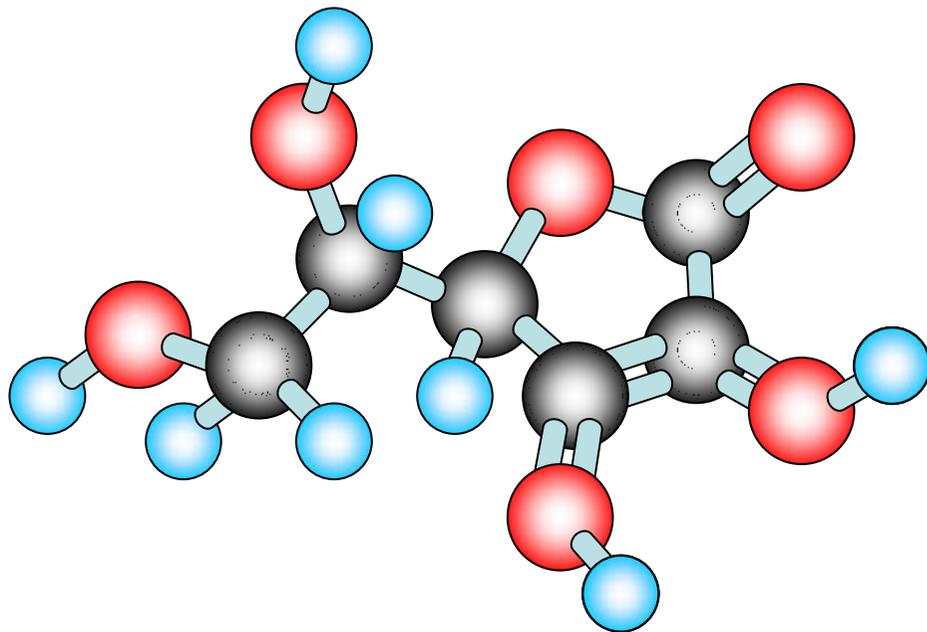
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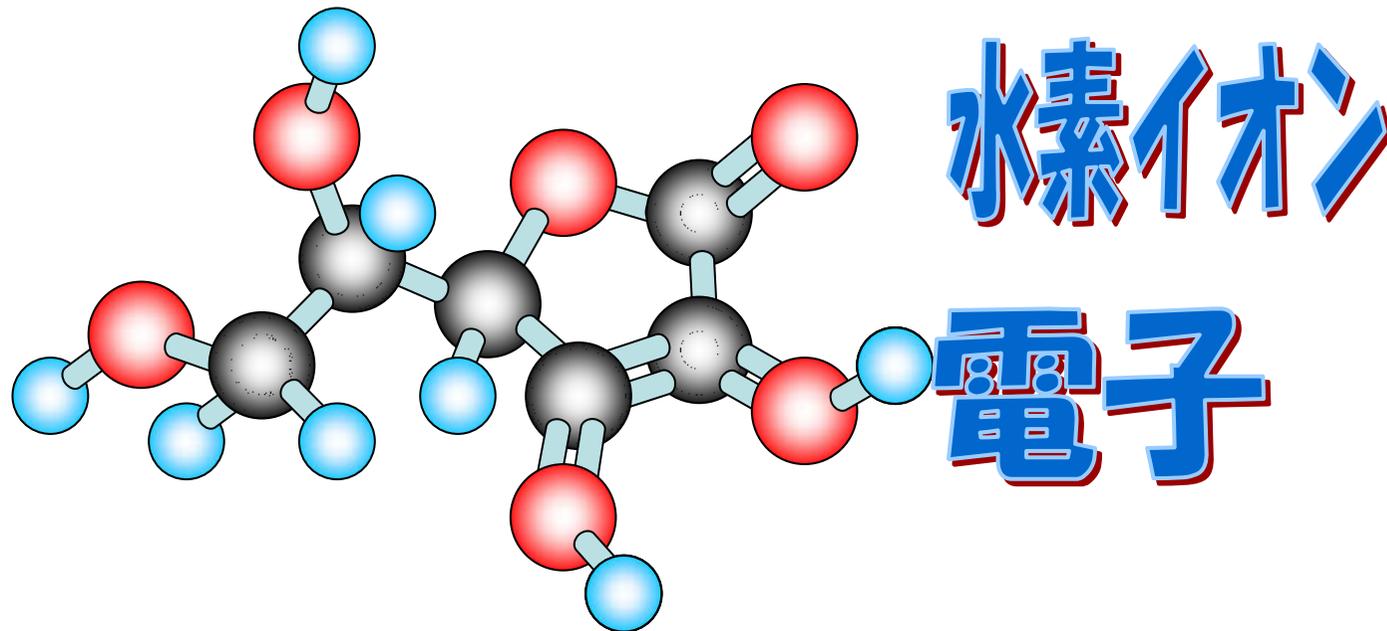
ビタミンC (アスコルビン酸)  
もハイポと同じ働きをする。



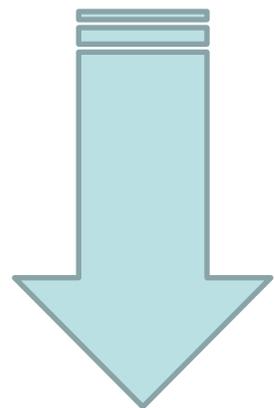
ビタミンC (アスコルビン酸)  
もハイポと同じ働きをする。



ビタミンC (アスコルビン酸)  
もハイポと同じ働きをする。



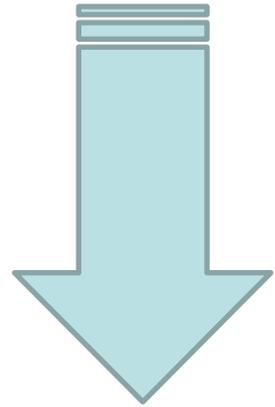
カルシウム



常温の水

カルシウムイオン

# マグネシウム

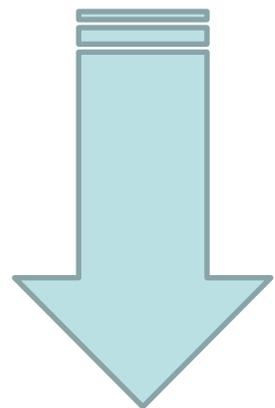


加熱したお湯

塩酸

# マグネシウムイオン

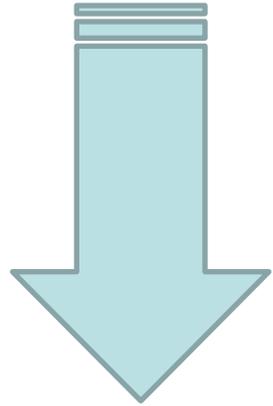
アルミニウム



塩酸

アルミニウムイオン

銅



塩酸

過酸化水素

銅イオン

職集で和菓しよう!



科学の心  
科学の心

眼の日本創り  
眼の日本創り

