

The background features a blue grid pattern. A large, glowing, upward-pointing arrow is positioned on the right side, with a wavy ribbon-like shape extending from the bottom left towards its base. The ribbon has a multi-colored, shimmering texture. On the right side, there are vertical tick marks and numbers (16, 17, 18) indicating a scale. At the top right, there is a horizontal, glowing, pill-shaped bar. At the bottom, there is a rounded rectangular bar with a metallic gradient.

*Марганец*

**LOGO**

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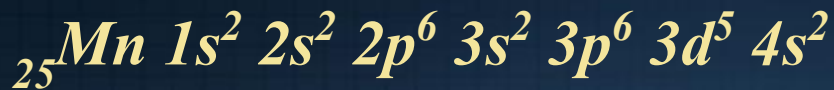
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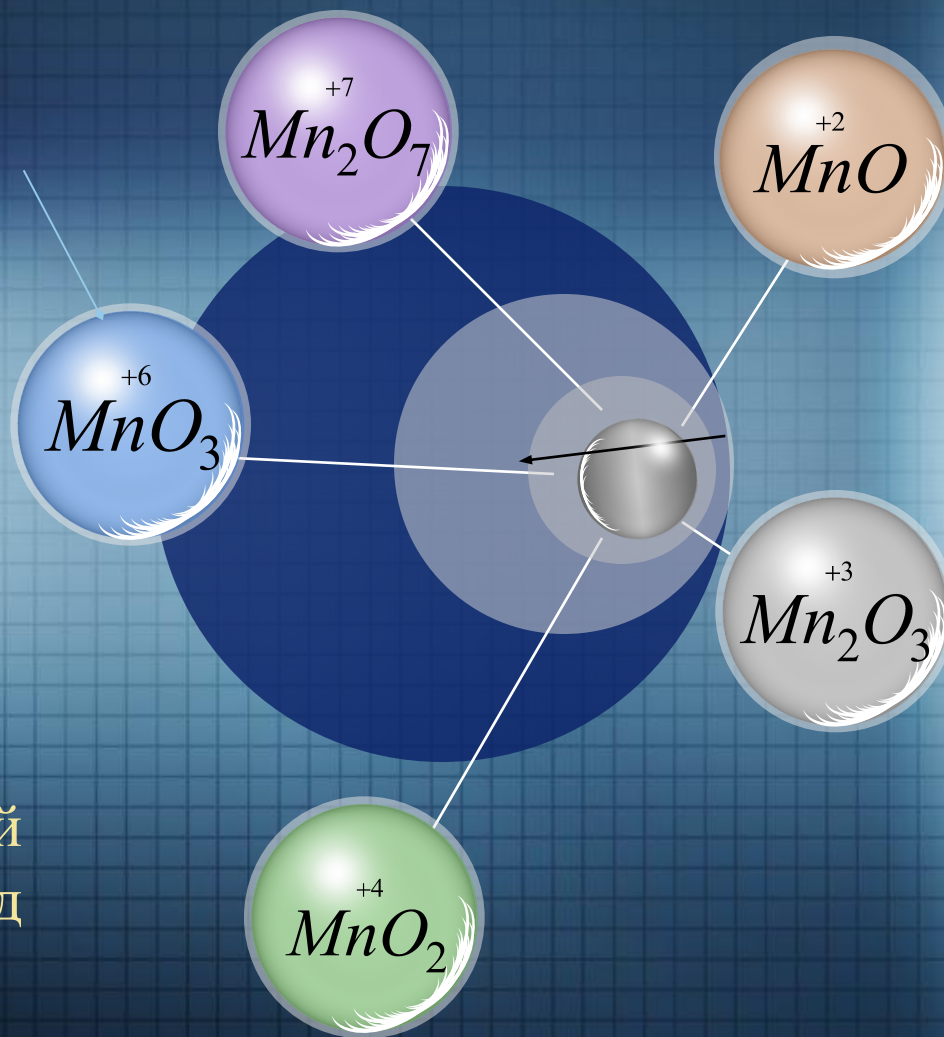
8

*Задание*



IV период, VII группа, побочная подгруппа

Кислотные  
оксиды

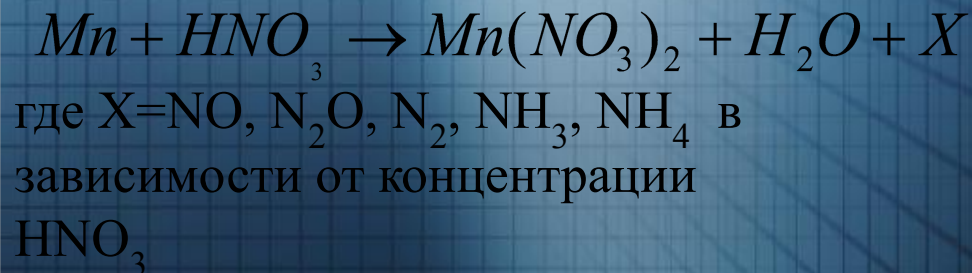
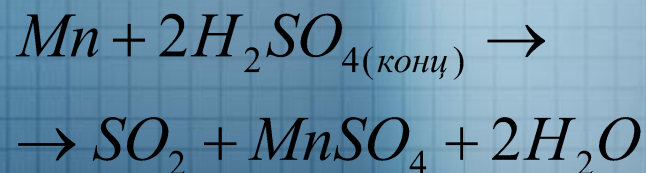
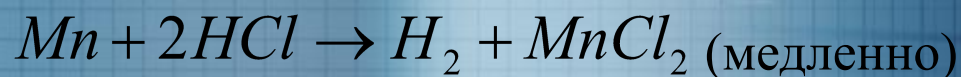
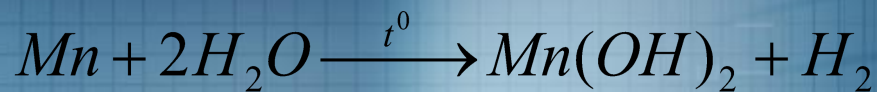
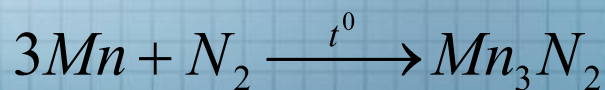
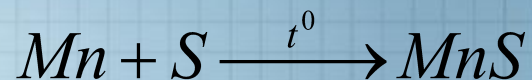
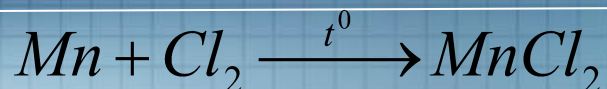
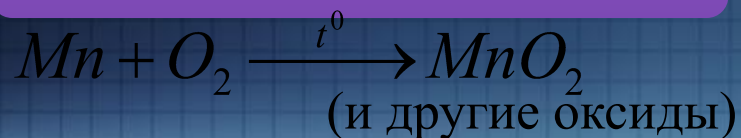


Основные  
оксиды

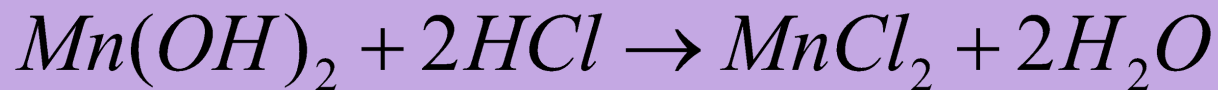
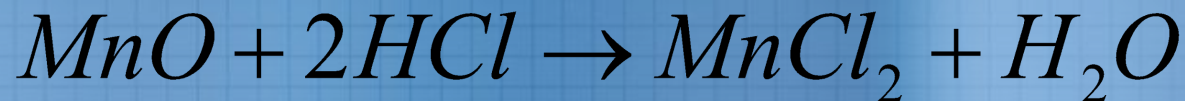
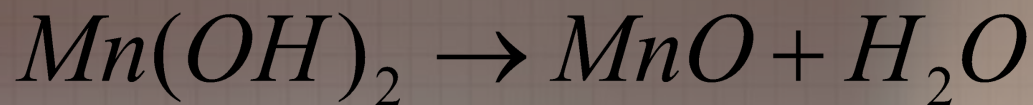
Амфотерный  
оксид



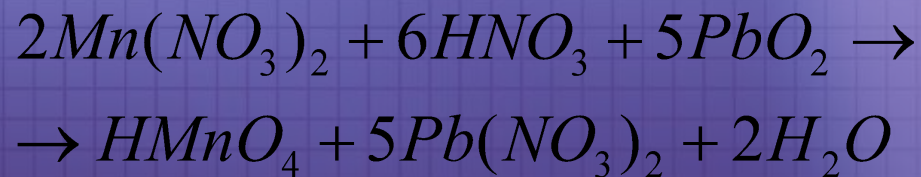
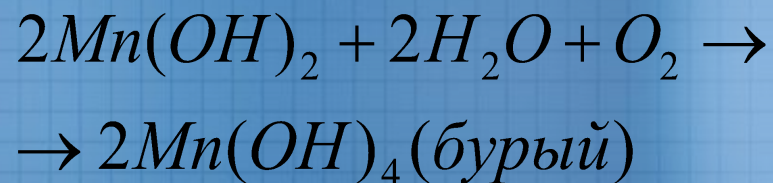
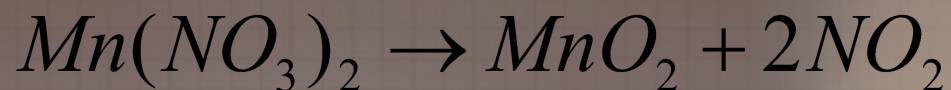
# Химические свойства



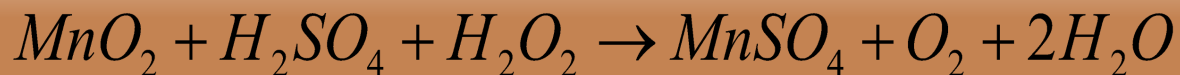
*MnO, Mn(OH)<sub>2</sub> –  
основные свойства*



## *$Mn^{+2}$ - восстановитель*

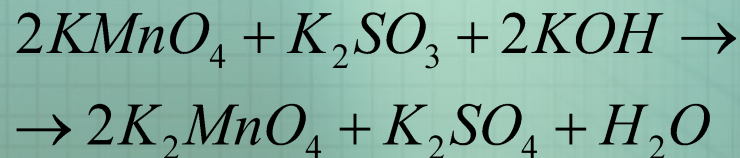
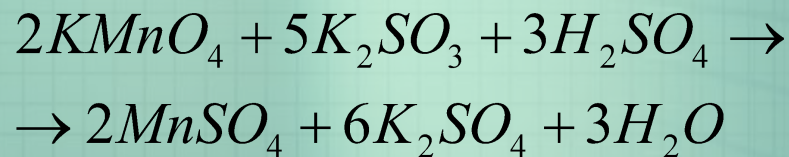
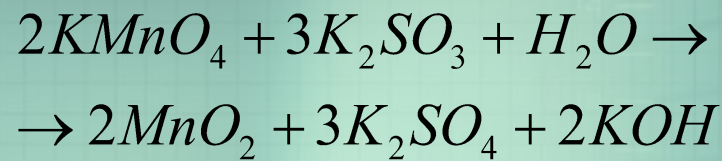
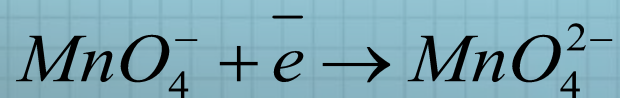
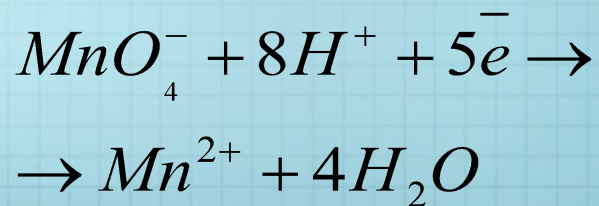
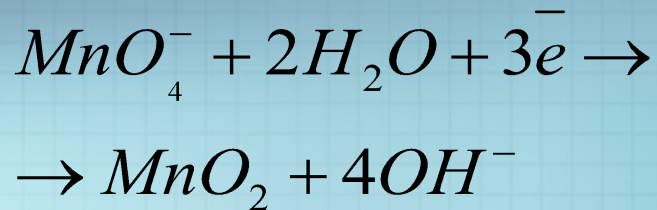


*$MnO_2$ ,  $Mn(OH)_4$  или  $H_2MnO_3$*   
*слабо выраженные*  
*амфотерные свойства*



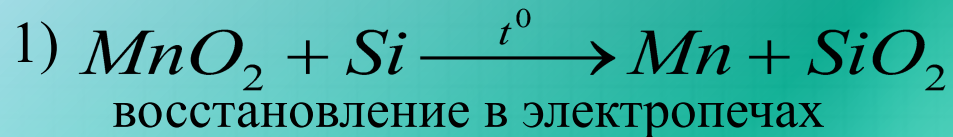
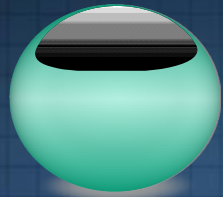


$Mn_2O_7$ ,  $HMnO_4^-$  —  
сильные окислители

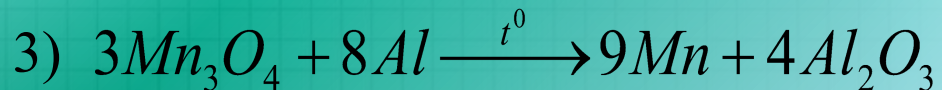
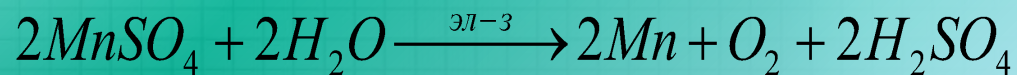
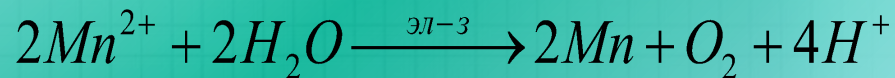
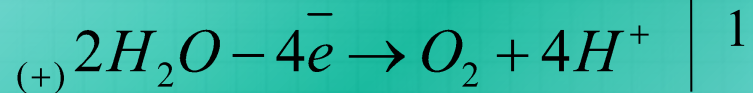
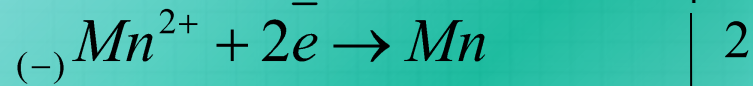




# Получение



2) электролиз раствора  $MnSO_4$



# *Применение*

твёрдость

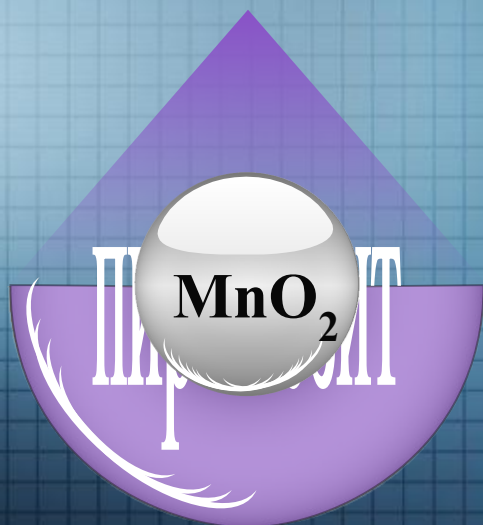
прочность

устойчивость к коррозии

Производство  
легированных сталей

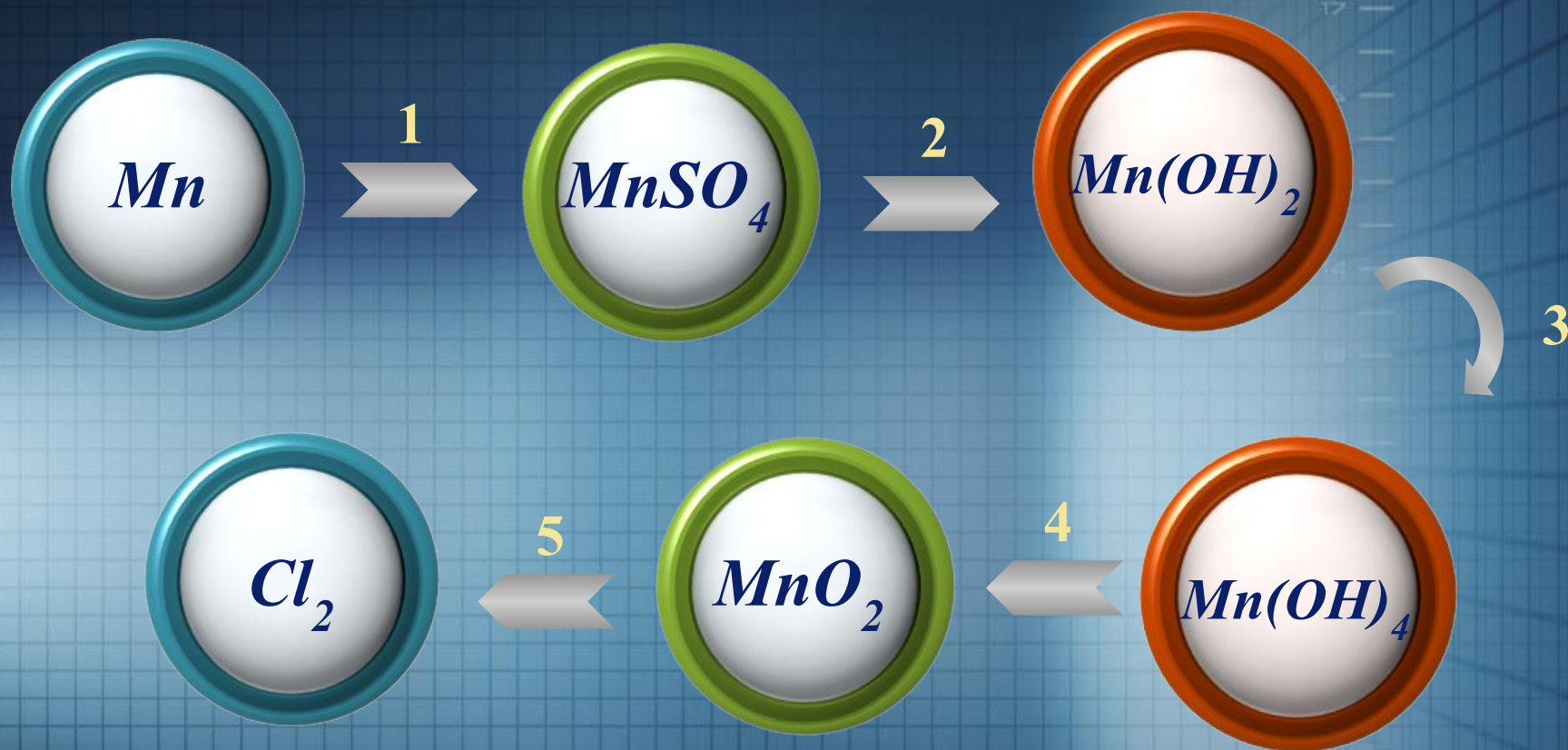
# *В природе*

$\omega(\text{Mn}) = 0,09\%$





# Задание

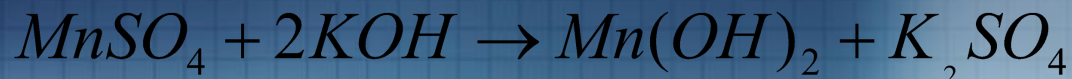


# Ответ

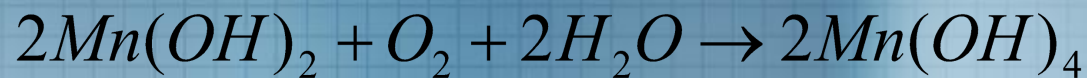
1



2



3



4



5



Спасибо за внимание!

LOGO