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OXIDISING POWER OF HALOGENS

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DISPLACEMENT IN AQUEOUS SOLUTION

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$			
$Br^-(aq)$			
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Stays yellow solution (no reaction)	
$Br^-(aq)$			
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Stays yellow solution (no reaction)	Stays brown solution (no reaction)
$Br^-(aq)$			
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Stays yellow solution (no reaction)	Stays brown solution (no reaction)
$Br^-(aq)$	Yellow solution forms (Br_2 forms) $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Stays yellow solution (no reaction)	Stays brown solution (no reaction)
$Br^-(aq)$	Yellow solution forms (Br_2 forms) $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		Stays brown solution (no reaction)
$I^-(aq)$			

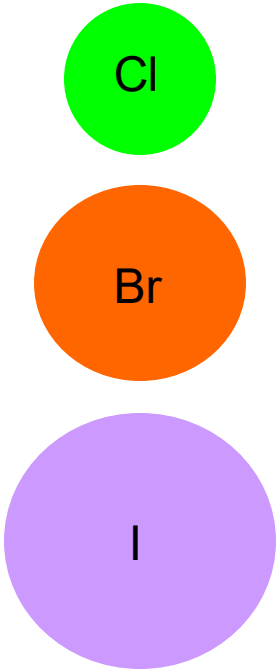
	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Stays yellow solution (no reaction)	Stays brown solution (no reaction)
$Br^-(aq)$	Yellow solution forms (Br_2 forms) $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		Stays brown solution (no reaction)
$I^-(aq)$	Brown solution forms (I_2 forms) $Cl_2 + 2\ I^- \rightarrow 2\ Cl^- + I_2$		

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Stays yellow solution (no reaction)	Stays brown solution (no reaction)
$Br^-(aq)$	Yellow solution forms (Br_2 forms) $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		Stays brown solution (no reaction)
$I^-(aq)$	Brown solution forms (I_2 forms) $Cl_2 + 2\ I^- \rightarrow 2\ Cl^- + I_2$	Brown solution forms (I_2 forms) $Br_2 + 2\ I^- \rightarrow 2\ Br^- + I_2$	

Oxidising power trend: $Cl_2 > Br_2 > I_2$

When a halogen acts as an oxidising agent, it gains electrons (taken from the oxidised species).

$$X_2 + 2e^- \rightarrow 2X^-$$



Down the group it becomes harder to gain an electron because:

atoms are larger & there is more shielding (due to extra electron shell)

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DISPLACEMENT IN AQUEOUS SOLUTION

followed by ORGANIC SOLVENT

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$			
$Br^-(aq)$			
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Yellow solution (organic layer)	
$Br^-(aq)$			
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Yellow solution (organic layer)	Purple solution (organic layer)
$Br^-(aq)$			
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Yellow solution (organic layer)	Purple solution (organic layer)
$Br^-(aq)$	Yellow solution (organic layer) as Br_2 forms $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Yellow solution (organic layer)	Purple solution (organic layer)
$Br^-(aq)$	Yellow solution (organic layer) as Br_2 forms $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		Purple solution (organic layer)
$I^-(aq)$			

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Yellow solution (organic layer)	Purple solution (organic layer)
$Br^-(aq)$	Yellow solution (organic layer) as Br_2 forms $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		Purple solution (organic layer)
$I^-(aq)$	Purple solution (organic layer) as I_2 forms $Cl_2 + 2\ I^- \rightarrow 2\ Cl^- + I_2$		

	$Cl_2(aq)$	$Br_2(aq)$	$I_2(aq)$
$Cl^-(aq)$		Yellow solution (organic layer)	Purple solution (organic layer)
$Br^-(aq)$	Yellow solution (organic layer) as Br_2 forms $Cl_2 + 2\ Br^- \rightarrow 2\ Cl^- + Br_2$		Purple solution (organic layer)
$I^-(aq)$	Purple solution (organic layer) as I_2 forms $Cl_2 + 2\ I^- \rightarrow 2\ Cl^- + I_2$	Yellow solution (organic layer) as Br_2 forms $Br_2 + 2\ I^- \rightarrow 2\ Br^- + I_2$	

Oxidising power trend: $Cl_2 > Br_2 > I_2$

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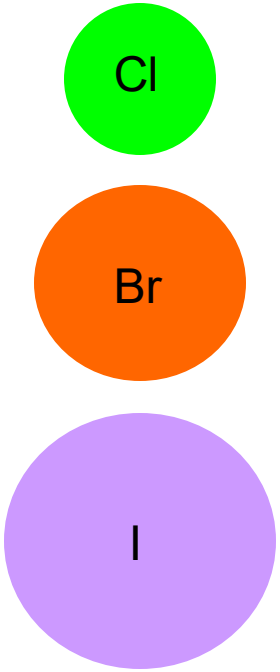

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