

Electrolytes vs Non-electrolytes

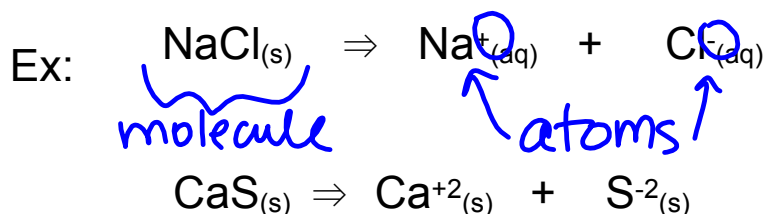
	Electrolyte	Non-electrolyte
Definit- ion	Substances when dissolved in water conduct electricity.	Substances when dissolved in water DO NOT conduct electricity.
Why	Because when dissolved in water ions (+ and - charge) are produced.	Because when dissolved in water ions ARE NOT produced.
Identify	The 1st element will start with a <u>metal</u> (Found in group 1, 2 or 3) ex- NaCl	The first element will start with a <u>non-metal</u> (found in groups 4-7) ex- PCl ₃

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Electrolyte Dissociation

Def: The separation of a molecule into its atoms



How to determine if electrolyte dissociation will occur?

Look at **1st** of compound.

1st element is a **metal** = **electrolyte** = electricity is produced

1st element is a **non-metal** = **non-electrolyte** = no electricity

*~~Elements~~ starting with 'H' will conduct electricity.
Molecules

Which examples will conduct electricity?

- CaCl₂ *e*
- H₂SO₄ *e*
- P₂S₃ *ne*
- KOH *e*
- SCl₂ *ne*
- CCl₄ *ne*

Periodic Table of the Elements © www.elementsdatabase.com

1 H																	2 He																												
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne																												
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar																												
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr																												
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe																												
55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn																												
87 Fr	88 Ra	89 Ac	104 Unq	105 Unp	106 Unh	107 Uns	108 Uno	109 Une	110 Unn																																				
<table border="1"> <tr> <td>58 Ce</td><td>59 Pr</td><td>60 Nd</td><td>61 Pm</td><td>62 Sm</td><td>63 Eu</td><td>64 Gd</td><td>65 Tb</td><td>66 Dy</td><td>67 Ho</td><td>68 Er</td><td>69 Tm</td><td>70 Yb</td><td>71 Lu</td> </tr> <tr> <td>90 Th</td><td>91 Pa</td><td>92 U</td><td>93 Np</td><td>94 Pu</td><td>95 Am</td><td>96 Cm</td><td>97 Bk</td><td>98 Cf</td><td>99 Es</td><td>100 Fm</td><td>101 Md</td><td>102 No</td><td>103 Lr</td> </tr> </table>																		58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr
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Conduction capabilities

Looking at the picture below, determine which solutions have high conductivity, low conductivity and no conductivity and explain why

The image shows five beakers containing blue liquid with various colored spheres representing ions. Handwritten blue text labels each beaker:

- Beaker 1:** Contains many small, multi-colored spheres. Label: "why Bright", "high Conductivity".
- Beaker 2:** Contains a few small, multi-colored spheres. Label: "not Bright", "conducts a bit low".
- Beaker 3:** Contains many small, multi-colored spheres. Label: "Bright", "conduct".
- Beaker 4:** Contains a few small, multi-colored spheres. Label: "not Bright", "conduct Low".
- Beaker 5:** Contains many small, blue spheres. Label: "NO Light (no ions)", "does not conduct".

Types of electrolytes

	Acid	Base	Salt
Electrolyte	YES	YES	YES
Litmus paper	Blue → Red	Red → Blue	X
Found in	Fruits batteries vinegar cola	cleaning products	table salt bath salts fertilizers
Recognize	1 st element H	ends with "OH"	1 st element is a metal 2 nd element non-metal
Examples	HCl H ₃ PO ₄ H ₂ SO ₄	NaOH LiOH Ca(OH) ₂ Al(OH) ₃	NaCl LiCl MgBr ₂
Exceptions Memorize	H ₂ O H ₂ S H ₂ O ₂	C ₂ H ₅ OH CH ₃ OH	X

From the molecular formula, how can you determine if a substance is a non-electrolyte?



- ① does not start with "H"
- ② does not end with "OH"
- ③ first element not a metal

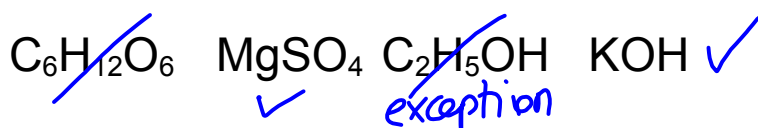
NON-ELECTROLYTE

Past Exam Questions

1. You have a sample of sodium hydroxide (NaOH), which is a white solid. You want to show in the laboratory that this sample is a base. Under which condition will this sample manifest its basic properties?

- A) On condition that it is dissolved in water
B) On condition that there is sufficient quantity of it
C) On condition that it is sufficiently compressed
D) On condition that it is in powder form

2. The following four compounds are to be mixed (separately) with water:



Which two of these compounds will produce an electrolytic solution when mixed with water?

- A) C₆H₁₂O₆ and MgSO₄
 B) MgSO₄ and KOH
C) C₆H₁₂O₆ and C₂H₅OH
D) C₂H₅OH and KOH
- electrolyte*

1. Four chemical substances are given below.

1. H₂SO₄ 2. Ca(OH)₂
3. MgCl₂ 4. ~~C₂H₅OH~~

Which of these substances is a base?

- A) Substance 1
 B) Substance 2
C) Substance 3
D) Substance 4

Attachments



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