

## Learning objectives:

### Basic Inorganic Chemistry

- Nomenclature of salts and mineral acids
- Stoichiometry - the ratio of ions

### Basic Organic Chemistry

- Nomenclature of organic compounds
- Molecular formula in 2- and 3D

Hazard Symbols, equations, and something about famous chemical pioneers

### How is learning achieved?

The motto is “learning by playing”. When discarding a card, the player names the compound depicted on the card correctly.





## The inorganic deck of cards

Cations	Symbol /Formula	Anions	
hydrogenium	$H^+$	chloride $Cl^-$	carbonate $CO_3^{2-}$
sodium	$Na^+$	bromide $Br^-$	nitrate $NO_3^-$
magnesium	$Mg^{2+}$	iodide $I^-$	sulphate $SO_4^{2-}$
calcium	$Ca^{2+}$	hydroxide $OH^-$	phosphate $PO_4^{3-}$
aluminium	$Al^{3+}$		

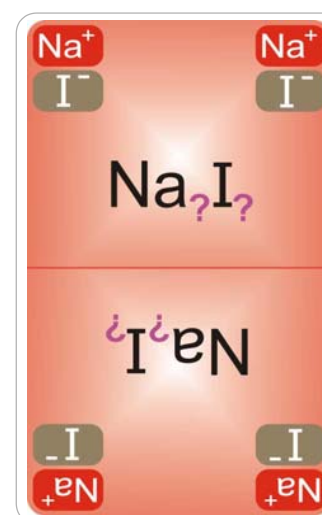
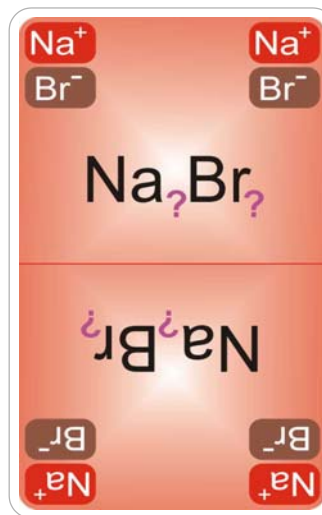
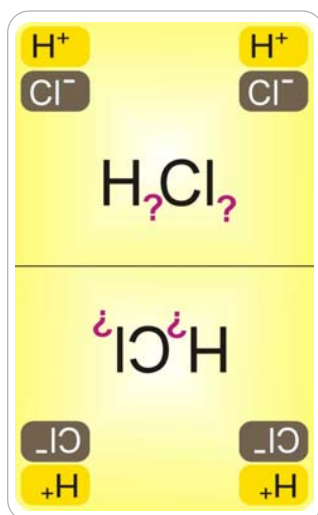
5 x 8 = **40** different salts, mineral acids and water are possible

## The inorganic deck of cards

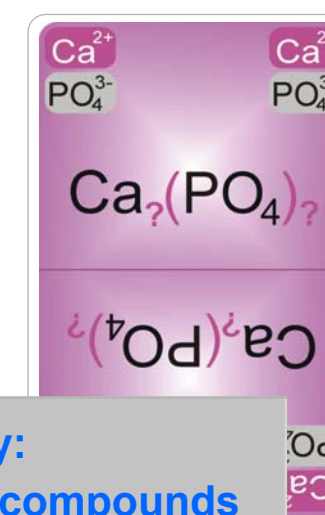
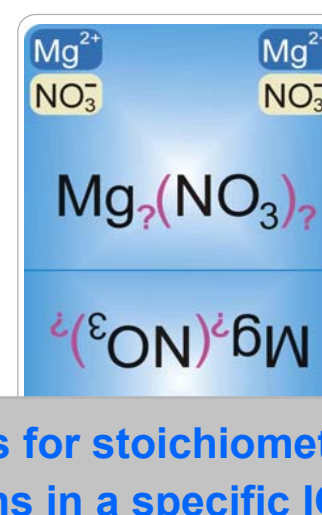
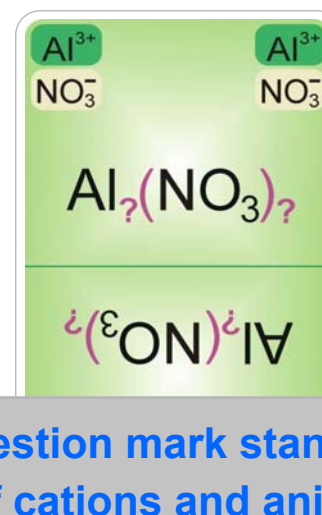
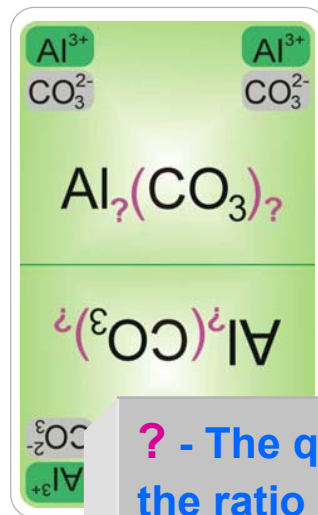
### Examples:

**Salts: anions, with the ending **-ide****

- and HCl to build chlorides



**Salts: anions with the ending **-ate****



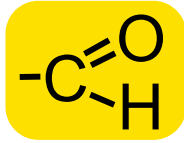
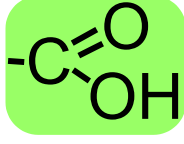



**? - The question mark stands for stoichiometry: the ratio of cations and anions in a specific IC compounds (see tables on pages 19 and 20 of the Chemundo Booklet)**



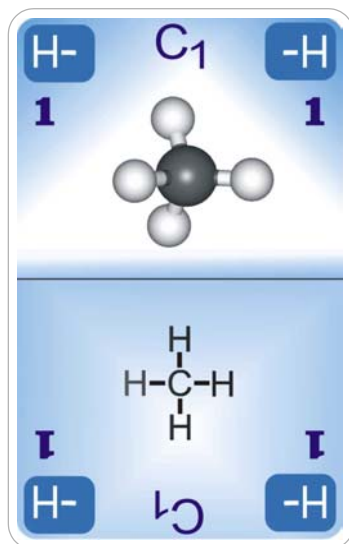
## Description of playing cards (3)

### The organic deck of cards

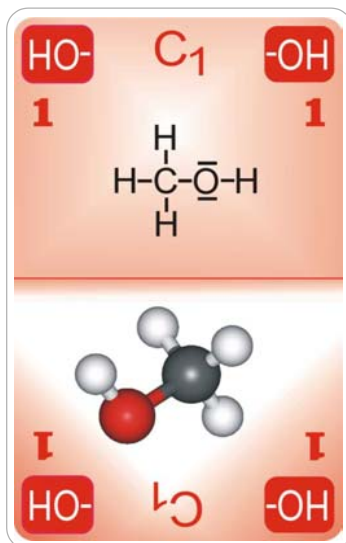
Homologous (aliphatic) series of	$n\text{-C}_1$ to $\text{C}_8$ n stands for linear chain	40	40 different organic compounds possible mark:
alkanes	methane -> octane		no substituent 
alkanols (alcohols)	methanol -> octanol		alcohol- function/group 
alkanals (aldehydes)	methanal ( <i>formaldehyde</i> ) -> octanal ( <i>caprylic aldehyde</i> )		aldehyde group 
alkanoic acids	methanoic -> octanoic acid ( <i>formic acide</i> -> <i>caprylic adic</i> )		carbocyclic acid group 
chloroalkanes	chloromethane -> chlorooctane		chloride function 

## The organic deck of cards

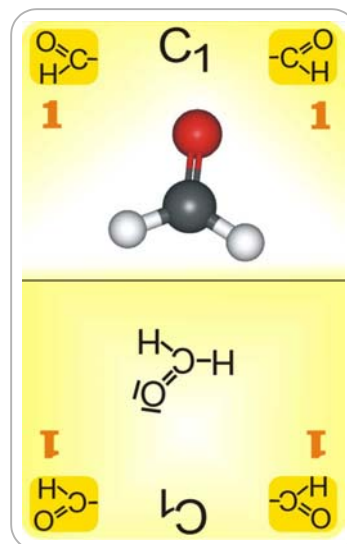
For example C<sub>1</sub>-compounds:



methane

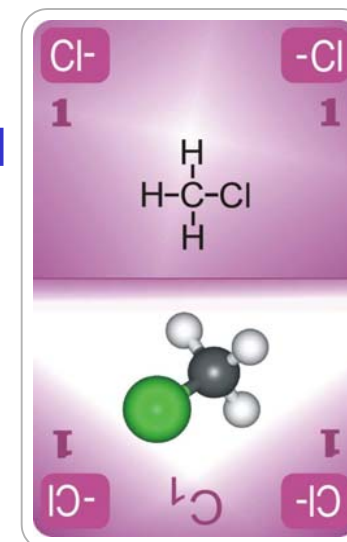
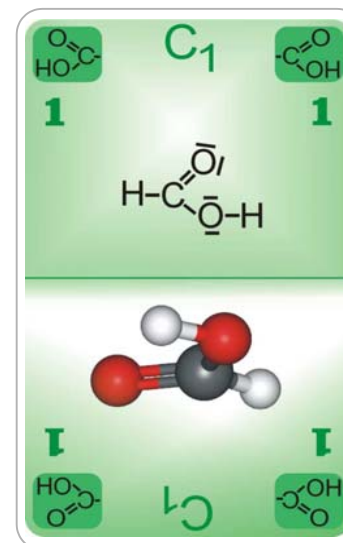


methanol



methanal

methanoic acid  
(formic acid)



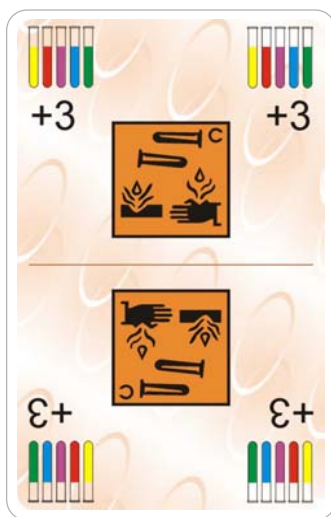
chloromethane  
(methyl chloride)



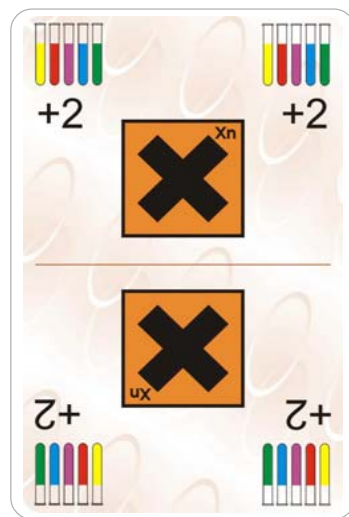
## Description of playing cards (5)

### Action cards (1)

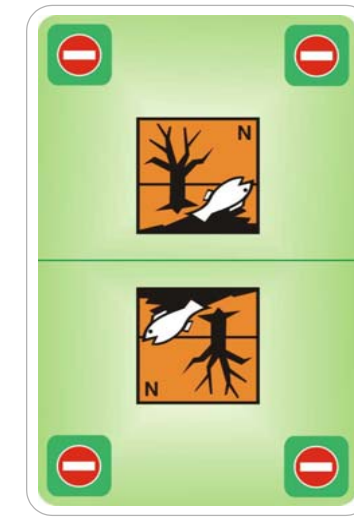
Action cards with hazard symbols and their impact on the game:



Subsequent player has to pick up 2 or 3 cards - CC option



All players pick up 1 card (excluding the player who leads)



Subsequent player has to skip one round.

CC = ,Change of color' for  
OC cards: change of a chem. homologous series  
IC cards: change of the cation



## Action cards (2)

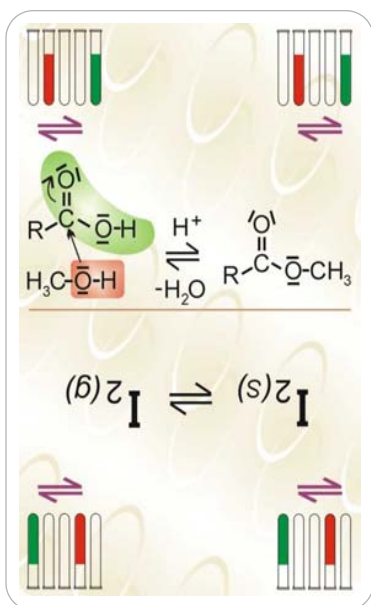


“Neutralization” card:  
 Player does not have to pick  
 up 1, 2 or 3 cards; and  
 CC option



CC = ,Change of color‘ –  
 OC cards: change of a chem.  
 homologous series  
 IC cards: change of cation

## Action cards (3)



### Equilibrium Reaction:

Direction of the game and hence the sequence of the players is reversed.

Option:

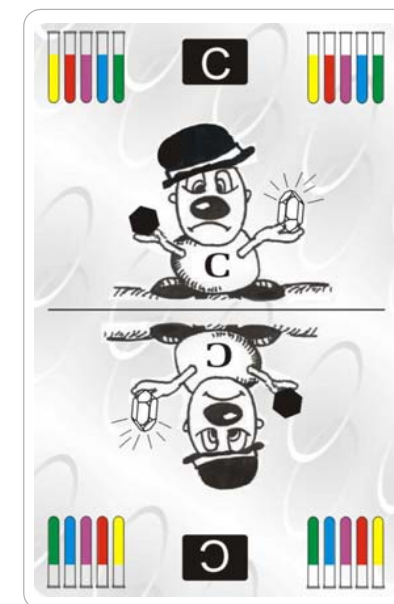
Limited change of colors



### Fortune Card (X):

The player may immediately discard another card of his choice or transfer it to a player of his choice - e.g. the coal man card.

Note: This card may only be discarded onto a yellow card !



### Coal Man (C-card):

The player who drops this card, receives one card from every player

Option: CC

Change of colors





When dropping a card, the player has to name properly:

- The hazard symbols of action cards
- The change of a homologous series or cation,  
Say: "Change to -sodium salts" (IC). or -"Change to alkanes". (OC). Try to avoid using the word "colors"
- The name (nomenclature) of OC-card compounds
- The name and stoichiometry (?) of IC-card compounds

Penalty: the player who names a compound incorrectly has to draw a penalty card.