BAB 5

NAMA, RUMUS, DAN PERSAMAAN KIMIA

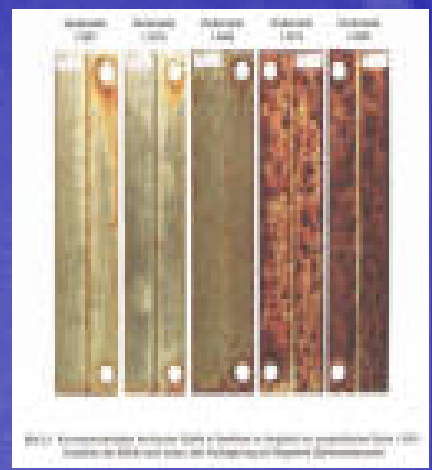
BESI BERGABUNG DENGAN OKSIGEN (UDARA)

MEMBENTUK KARAT

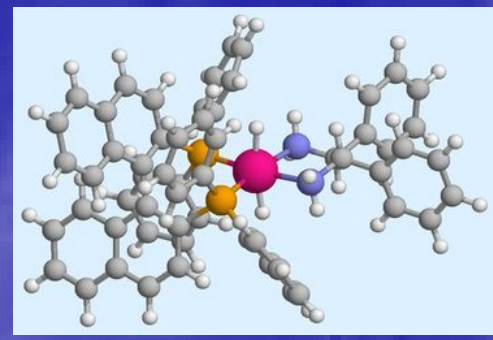
BAHASA KIMIA → REAKSI KIMIA

$$4\,Fe + 3\,O_2 \longrightarrow 2\,Fe_2O_3$$

4 ATOM BESI	3 MOLEKUL OKSIGEN	2 MOLEKUL BESI (II) OKSIDA
4 Mol Fe	3 Mol O_2	4 Mol Fe_2O_3



NAMA DAN SIMBOL ION



ION POSITIF (KATION)

$Al^{3+} + 3e^-$

ION ALUMINIUM

NAMA ION POSITIF = NAMA UNSUR INDUK + KATA ION INDUKNYA

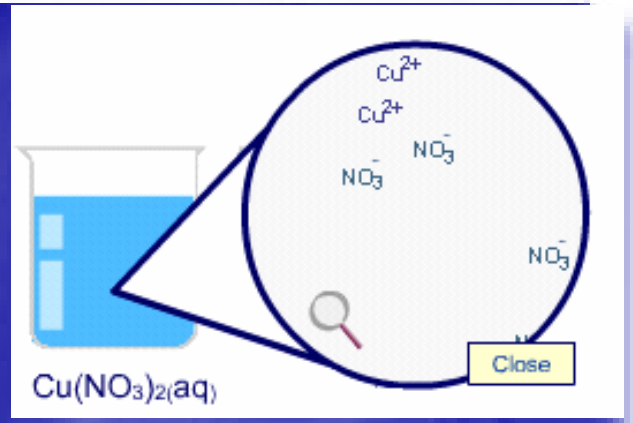
IA	Li	Li^+	ION LITIUM
	Na	Na^+	ION NATRIUM
II A	Mg	Mg^{2+}	ION MAGNESIUM
	Ca	Ca^{2+}	ION KALSIUM
III A	Al	Al^{3+}	ION ALUMINIUM

SIMBOL ION POSITIF		
	IA	+
	IIA	2+
	IIIA	3+

ION NEGATIF (ANION)

+ 2 e $^{-}$ ⟶ O $^{2-}$

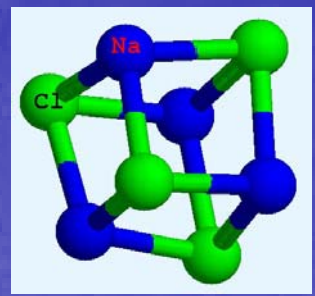
ION OKSIDA



NAMA ION NEGATIF = DITURUNKAN DARI NAMA UNSUR INDUK + AKIRAN -IDA

VA	N	N $^{3-}$	ION NITRIDA
VI A	O	O $^{2-}$	ION OKSIDA
VII A	Cl	Cl $^{-}$	ION KLORIDA

SIMBOL ION POSITIF	VA	3-
	VIA	2-
	VIIA	-



MUATAN ION NEGATIF = NO GOL. - 8

GOLONGAN B

IB	Cu	Cu^{+}	ION TEMBAGA (I)/ ION KUPRO
	Na	Cu^{2+}	ION TEMBAGA (II)/ ION KUPRI
	Ag	Ag^{+}	ION PERAK
II B	Zn	Zn^{2+}	ION SENG
VIII	Fe	Fe^{2+}	ION BESI (II)/ ION FERO
	Fe	Fe^{3+}	ION BESI (III)/ ION FERI

Hg ?????

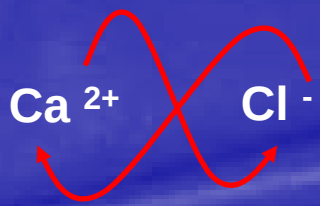
SENYAWA IONIK BINER

TERBENTUK DARI: GABUNGAN ION-ION BERMUATAN BERLAWANAN

RUMUS: - TULIS SETIAP ION DENGAN MUATANNYA ION POSITIF (DI KIRI)
- ANGKA MUATAN DISILANG DAN DITULIS SEBAGAI SUBSKRIP

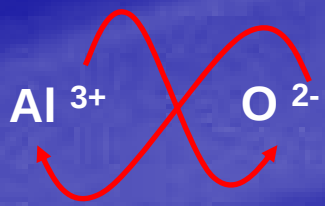
MISAL:

- **KALSIUM KLORIDA**



Ca^{2+} Cl_2^{-} ⟶ $CaCl_2$

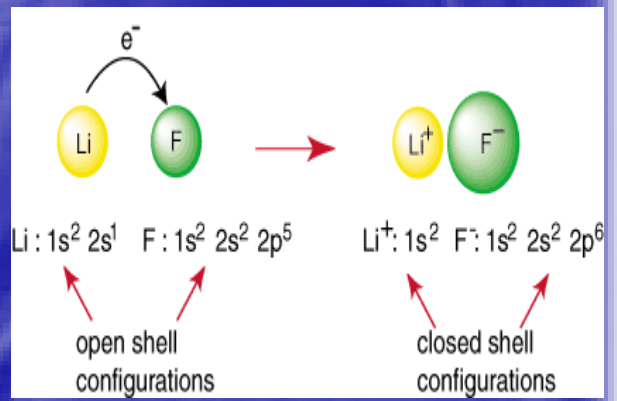
- **ALUMINIUM OKSIDA**

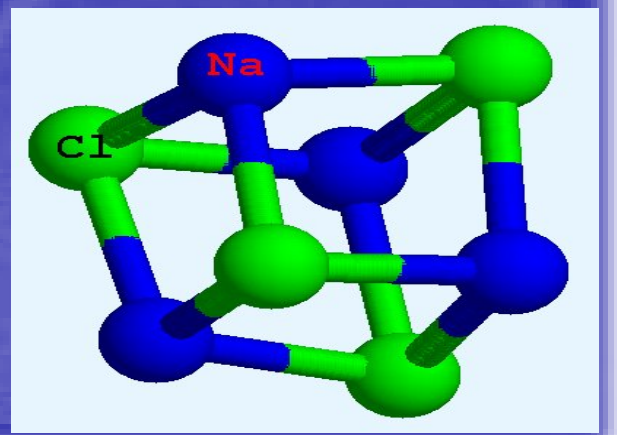


Al_2^{3+} O_3^{2-} ⟶ Al_2O_3

- **MAGNESIUM OKSIDA**

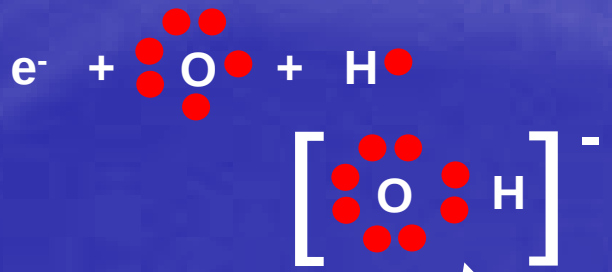
Al_2^{2+} O_2^{2-} ⟶ MgO





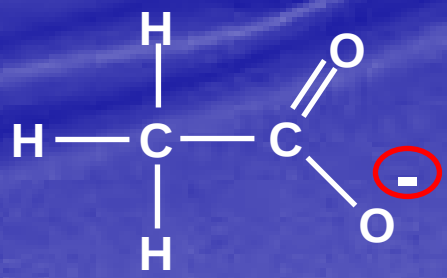
ION POLIATOM

- ION HIDROKSIDA (OH^-)

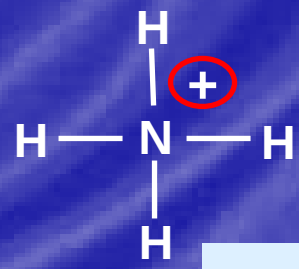


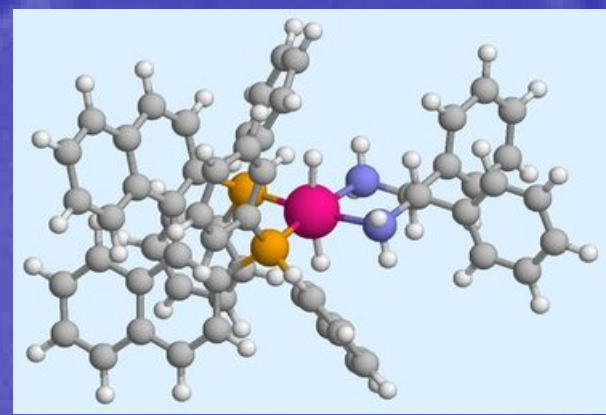
IKATAN KOVALEN

- ION ASETAT



- ION ASETAT



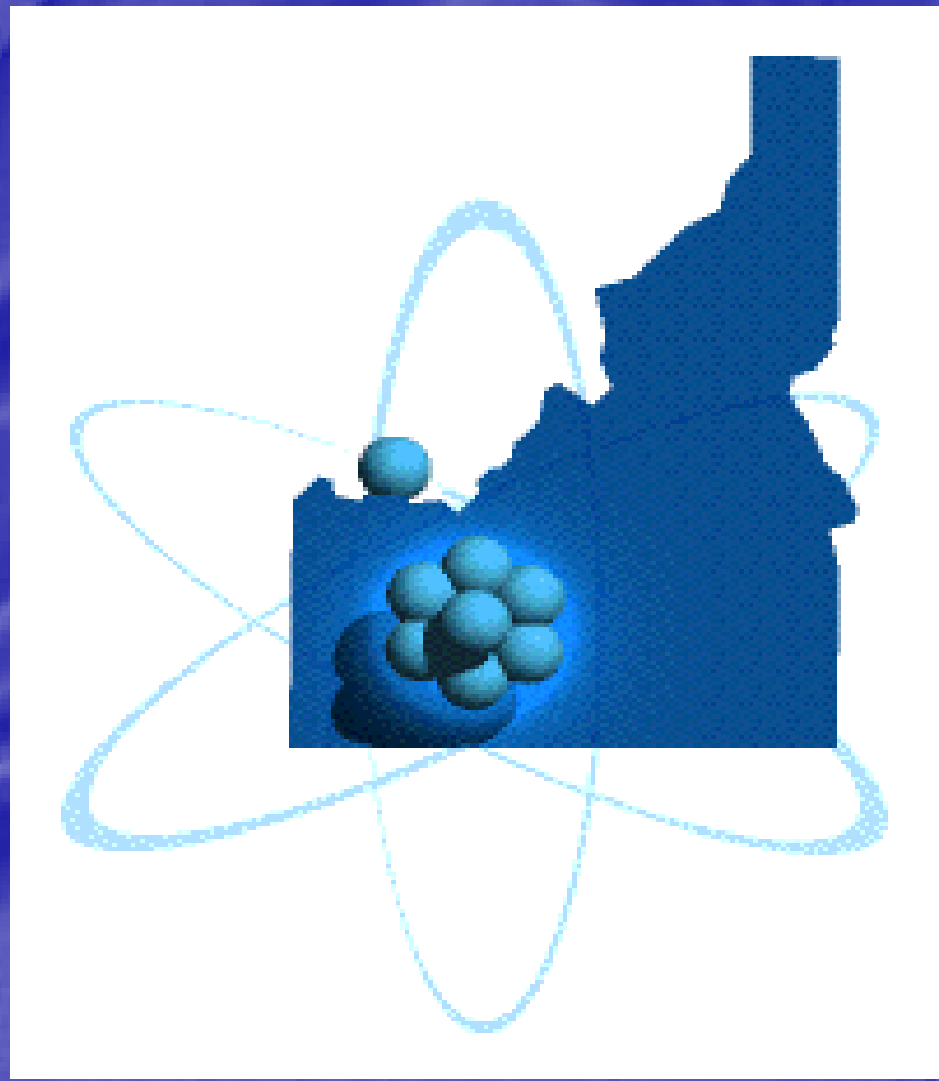


ION KARBONAT
ION HIDROGEN KARBONAT
ION NITRIT

LATIHAN

1. **TULIS RUMUS UNTUK:**
   - a. NATRIUM SULFAT
   - b. AMONIUM SULFIDA
   - c. ASAM FOSFAT

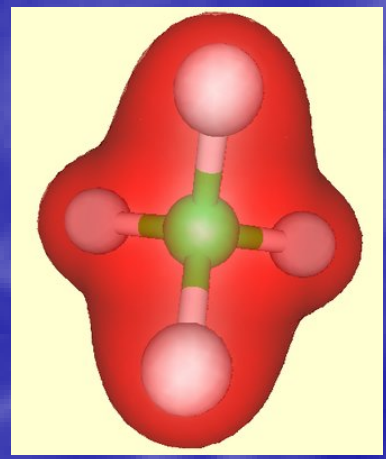
2. **APAKAH NAMA UNTUK:**
   - a. CaCO3
   - b. $Mg(HCO_3)_2$
   - c. $Ca(ClO)_2$

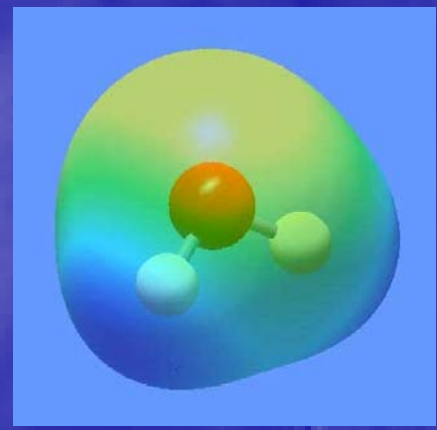


NAMA SENYAWA KOVALEN

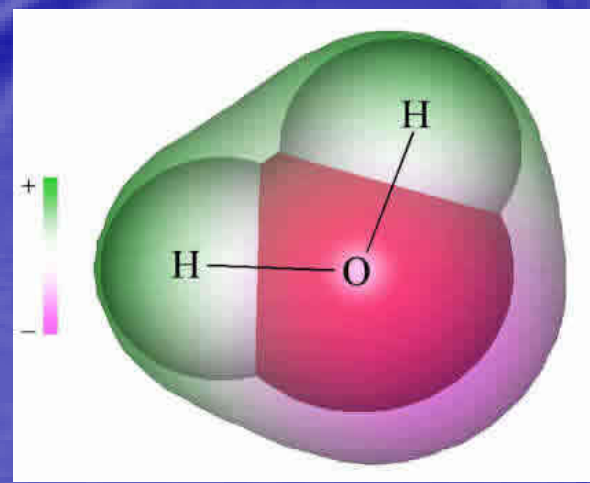
- **NAMA UMUM:**
  AIR – H_2O
  METANA – CH_4
  AMNONIA – NH_3

- **SENYAWA KOVALEN LAINNYA:**
  BERI AWALAN MONO- ; DI- ; TRI-





N_2O_4	DINITROGEN TETRAOKSIDA
NO_2	NITROGEN DIOKSIDA
CO	KARBON MONOKSIDA
CO_2	KARBON DIOKSIDA
SCl_2	BELERANG DIKLORIDA



PERSAMAAN KIMIA

KARBON BEREAKSI DENGAN OKSIGEN MEMBENTUK KARBONDIOKSIDA

$$C + O_2 \longrightarrow CO_2$$

PEREAKSI — HASIL REAKSI

1 ATOM C — 1 MOLEKUL O_2 — 1 MOLEKUL CO_2

HIDROGEN BEREAKSI DENGAN OKSIGEN MEMBENTUK AIR

$$H_2 + O_2 \longrightarrow H_2O$$

$$2\,H_2 + O_2 \longrightarrow 2\,H_2O$$

$$H_2 + O_2 \longrightarrow H_2O_2 \quad \text{(SALAH)}$$

KOEFISIEN REAKSI

$N_2 + H_2 \longrightarrow NH_3$

- KONSEP PENGGANDAAN TERKECIL

HIDROGEN: KIRI = 2

KANAN = 3

PENGGANDA TERKECIL DARI 2 DAN 3 = 6

$N_2 + H_2 \longrightarrow NH_3$

3 2

$Fe + O_2 \longrightarrow Fe_2O_3$

4 3 2

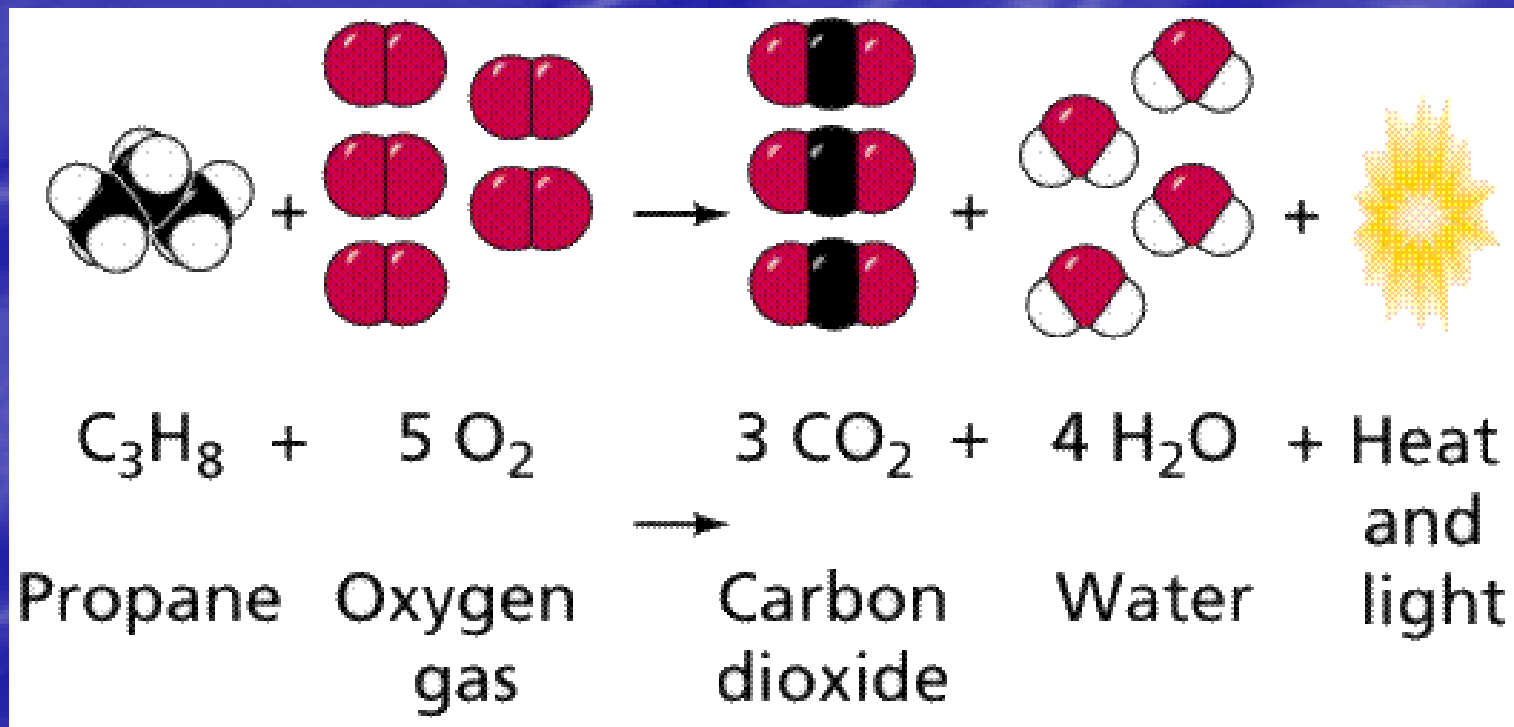
$CH_4 + O_2 \longrightarrow CO2 + H_2O$

1 2 1 2

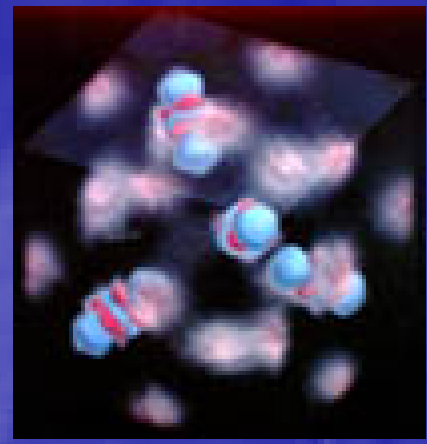
LATIHAN

LENGKAPI KOEFISIEN REAKSI BERIKUT:

1. $C_7H_8 + HNO_3 \longrightarrow C_7H_5 + N_3O_6 + H_2O$
2. $C_3H_2 + O_2 \longrightarrow CO_2 + H_2O$
3. $Pb + PbO_2 + H_2SO_4 \longrightarrow PbSO_4 + H_2O$



PERHITUNGAN KIMIA DAN MOL



$C + O_2 \longrightarrow CO_2$

1 ATOM C + 1 MOLEKUL O_2 → 1 MOLEKUL CO_2

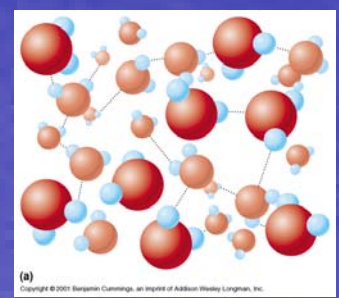
NISBAH $C : O_2 = 12 : 32$

$2C + O_2 \longrightarrow 2CO$

NISBAH $C : O_2 = 24 : 32$

BOBOT RUMUS:

O_3	= 3 x 16	= 48 sma
NH_3	= 14 + (3 x 1)	= 17 sma
$C_6H_{12}O_6$	= 72 + 12 + 96	= 180 sma
$(NH_4)_2SO_4$	= 132 sma	



MOL

JUMLAH ZAT YANG BERISI SEBANYAK SATUAN DASAR SEPERTI BANYAKNYA ATOM DALAM 12 g ^{12}C

12 g C = 6.02 x 10^{23} ATOM C

BILANGAN AVOGADRO

1 mol C = 12 g C

1 mol O2 = 6.02 x 10^{23} MOLEKUL O_2

= 32 g O_2

1 mol $(NH_4)_2SO_4$ = 6.02 x 10^{23} UNIT RUMUS $(NH_4)_2SO_4$

= 132 g $(NH_4)_2SO_4$

$C + O_2 \rightarrow CO_2$

C	O_2	CO_2
1 ATOM C	1 MOLEKUL O_2	1 MOLEKUL CO_2
12 sma	32 sma	44 sma
6.02×10^{23} ATOM C	6.02×10^{23} MOLEKUL O_2	6.02×10^{23} MOLEKUL CO_2
12 g C	32 g O_2	44 g CO_2

FAKTOR KONVERSI

$$0.5 \text{ mol } CO_2 = 0.5 \text{ mol } CO_2 \times \frac{44 \text{ g } CO_2}{1 \text{ mol } CO_2}$$

$$= 22 \text{ g } CO_2$$