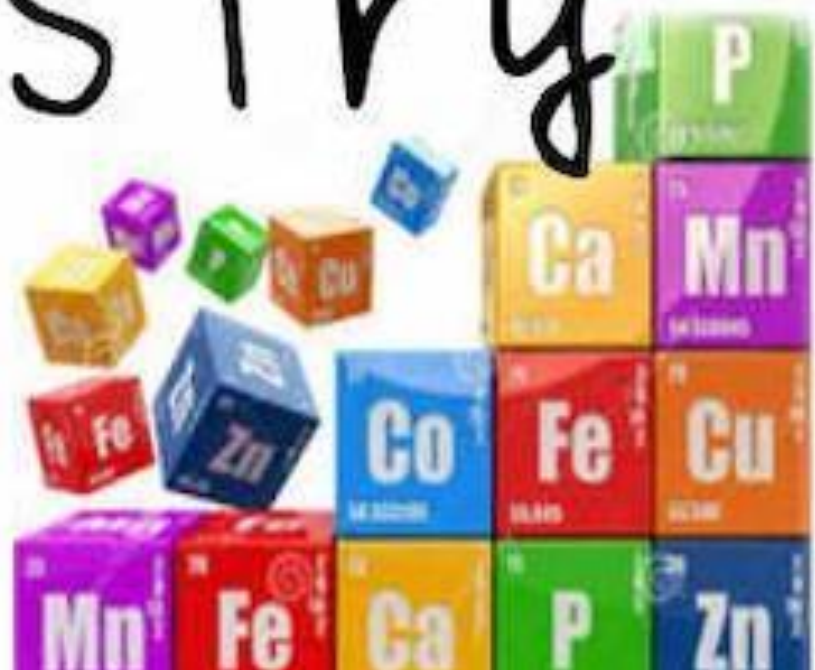




#scienceweek
8-15 Nov 2020



Chemistry



Round 1



Radioactive is a British biographical drama film starring Rosamund Pike. Which character does she play?

period	group 1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	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
5	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
6	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
7	87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og

- Alkali metals
- Alkaline-earth metals
- Transition metals
- Other metals
- Other nonmetals
- Halogens
- Noble gases
- Rare-earth elements (21, 39, 57–71) and lanthanoid elements (57–71 only)
- Actinoid elements

lanthanoid series 6	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
actinoid series 7	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

Which element is named after the Greek word for the sun Helios?

*Numbering system adopted by the International Union of Pure and Applied Chemistry (IUPAC). © Encyclopædia Britannica, Inc.



This salt gives a blue-green flame and a white precipitate with barium chloride which is insoluble in dilute HCl.
Identify it.



This gas is released during a barbecue when a carbon-based fuel - such as gas or charcoal - isn't given enough ventilation to burn adequately.

Identify it?

This recycling symbol may be found on your wheely bin. What does it represent?



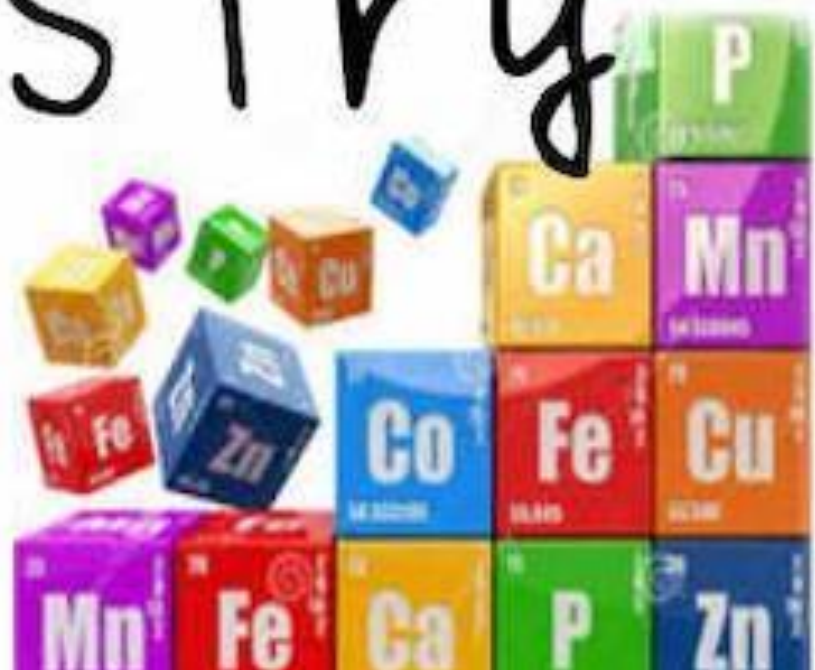


The IUPAC nomenclature of organic chemistry is a method of naming organic chemical compounds.

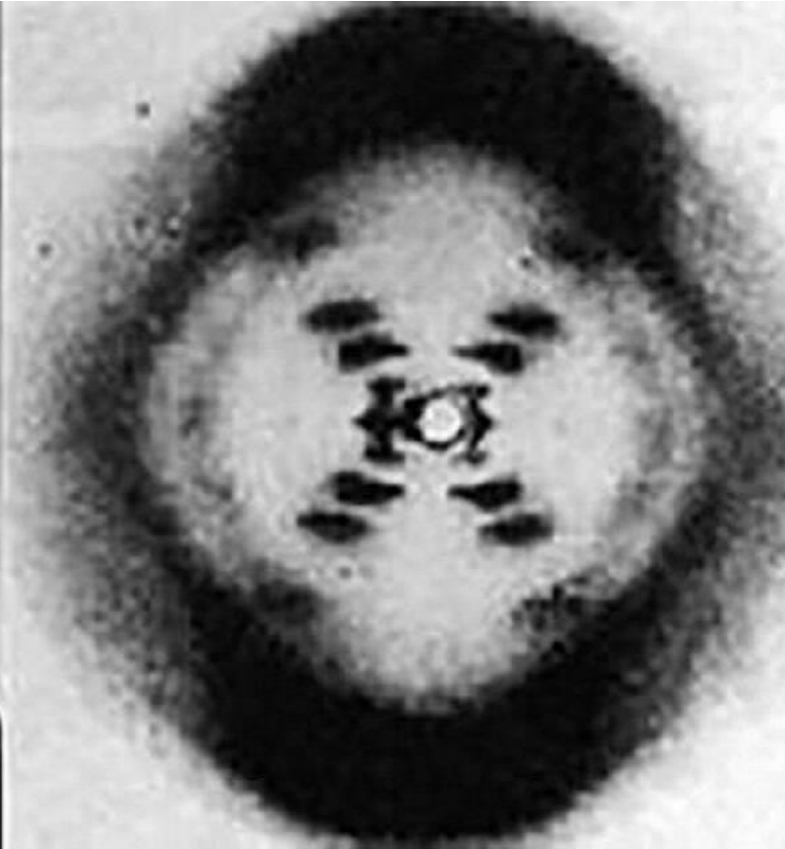
What does **IUPAC** stand for?



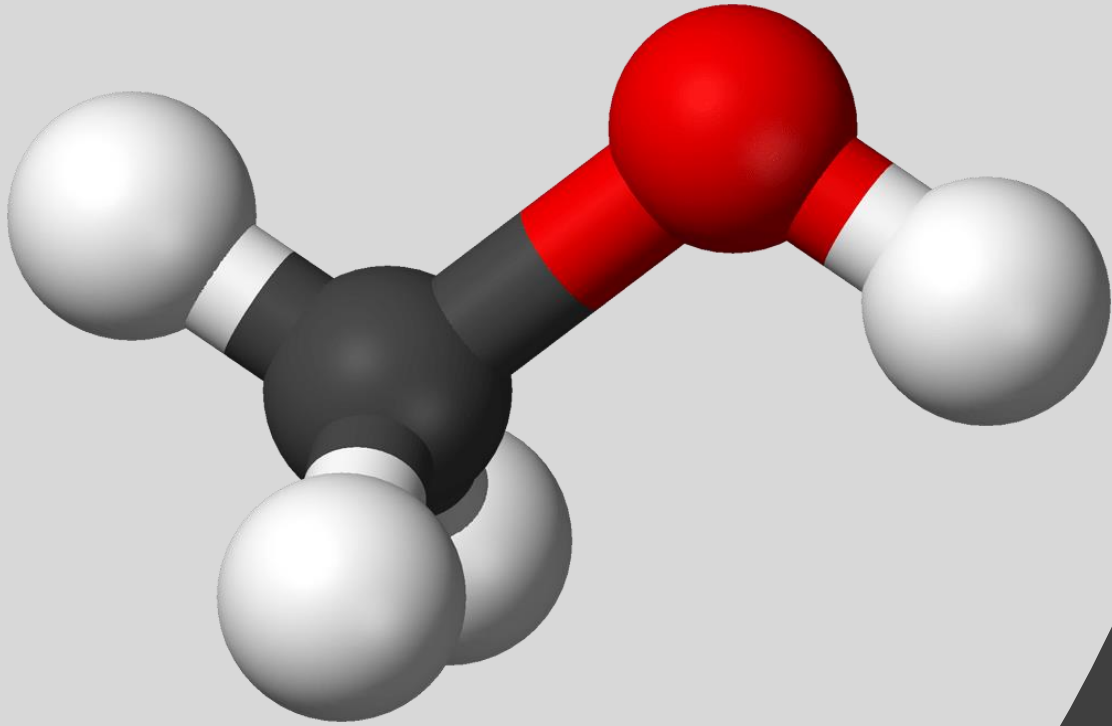
Chemistry



Round 2



Who is the often-forgotten British chemist whose work on X-ray diffraction images of DNA led to the discovery of the double helix structure?



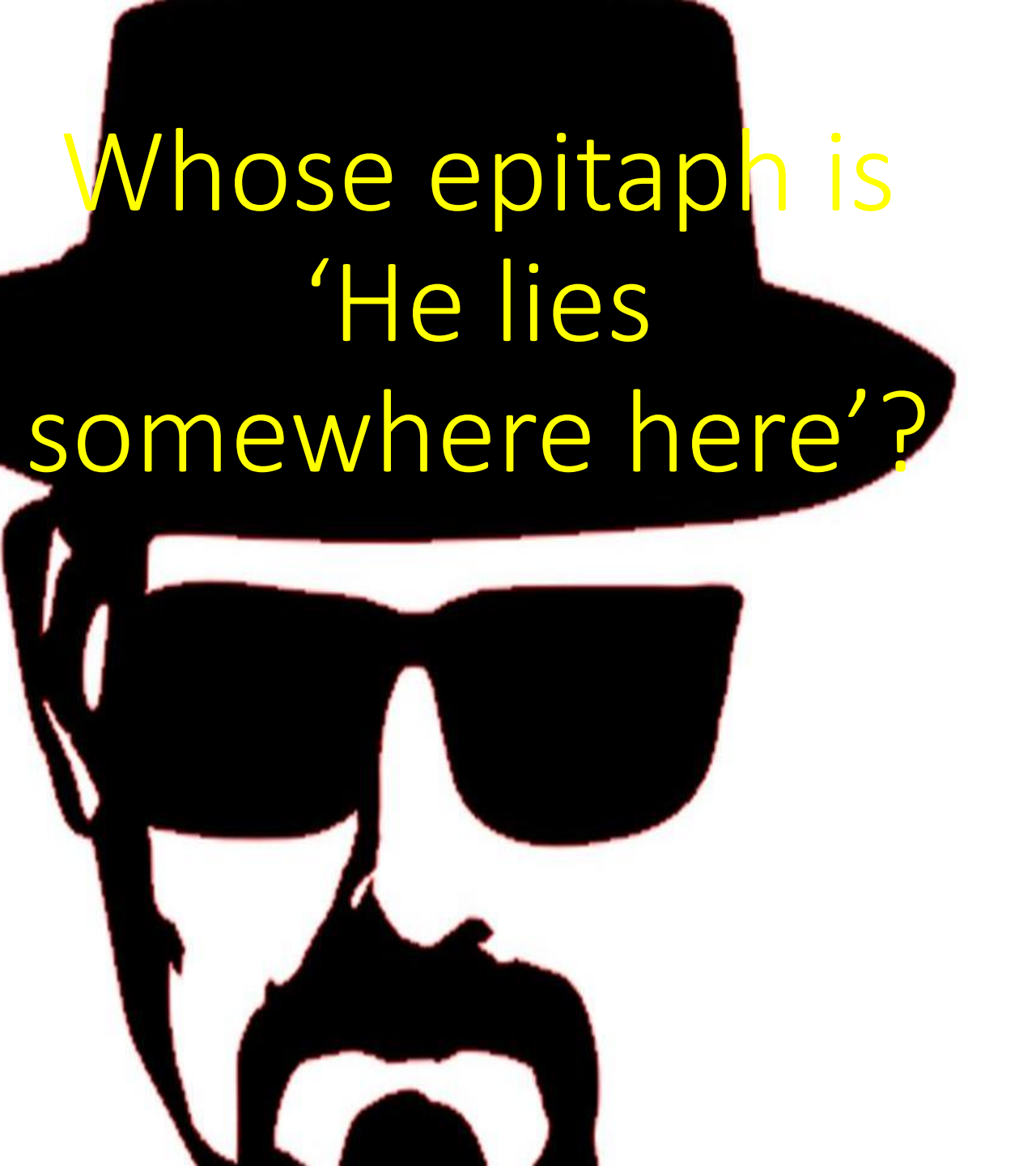
This nondrinking type of alcohol, also known as wood alcohol, is mostly used to create fuel, solvents and antifreeze.

It was incorrectly used in hand sanitizers recently.

Name it.



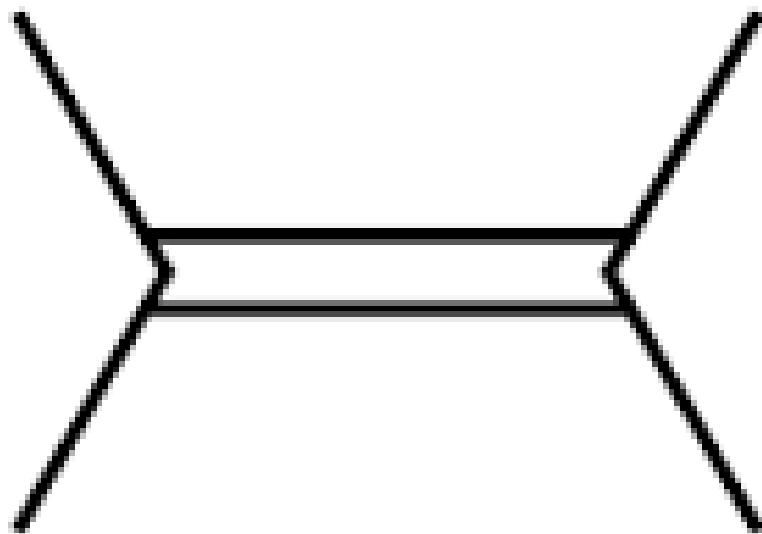
What is the
symbol for
tungsten?



Whose epitaph is
'He lies
somewhere here'?

H₃C

CH₃



H₃C

CH₃

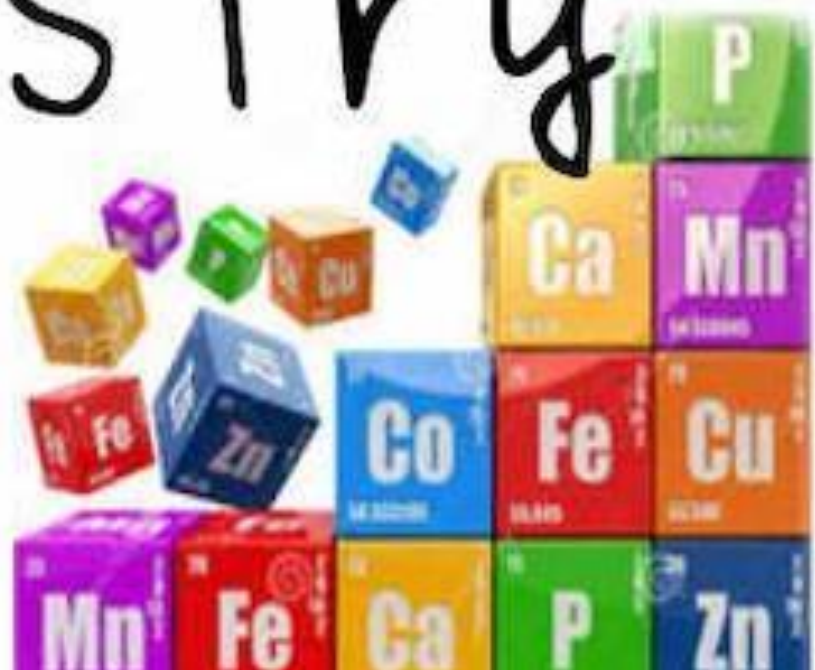
Give the
IUPAC name
for this
compound.



Which is the **symbol** for Rutherfordium?



Chemistry



Round 3



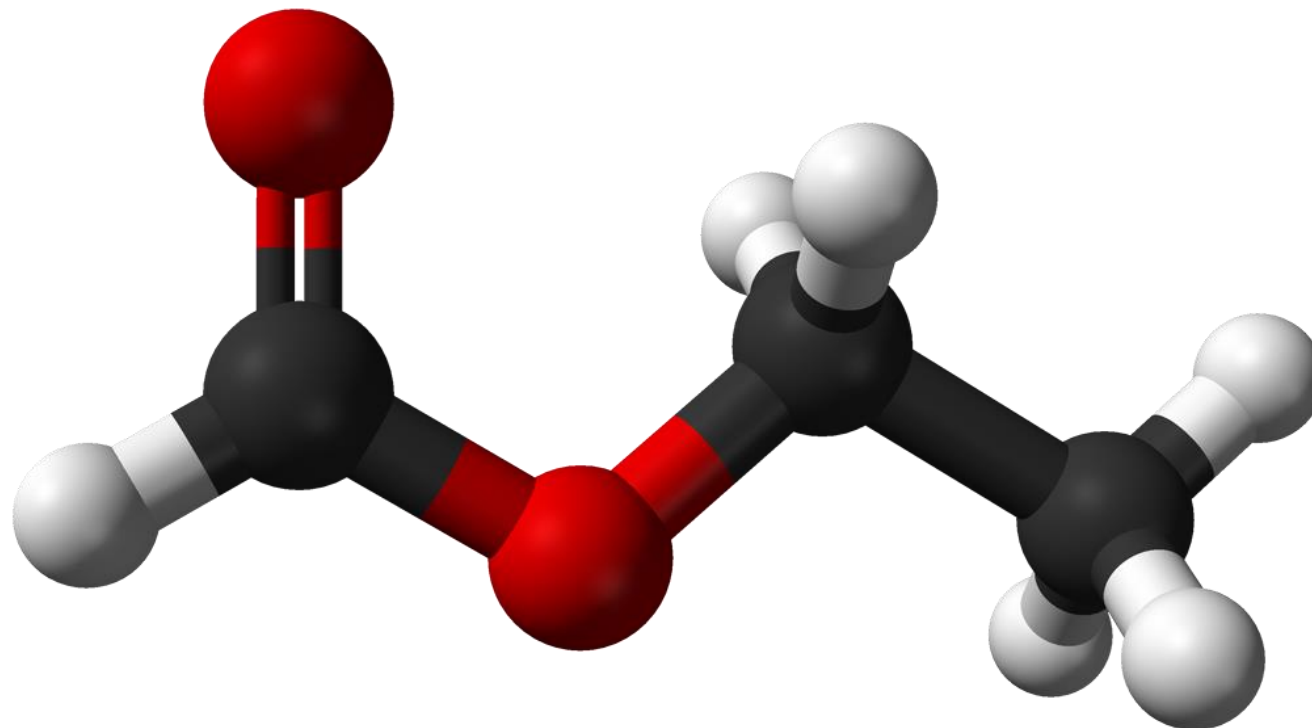
Dorothy Crowfoot Hodgkin was a British biochemist who discovered the structure of Vitamin B12 and insulin.

For which **instrumental technique** did she win the Nobel Prize in Chemistry in 1964.



Silica gel is encountered in everyday life and used as a desiccant absorbing moisture e.g. in cat litter. But in which **phase of chromatography** is it used?

Name an **acid** that is an isomer of **ethyl methanoate**.



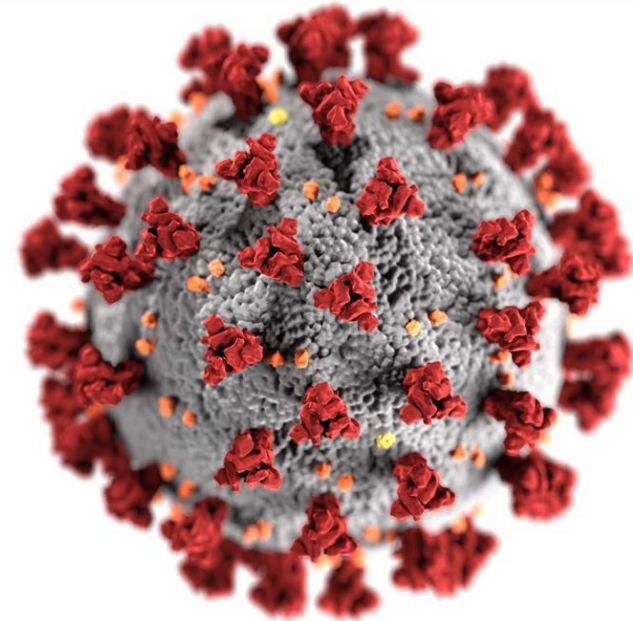


What is the
chemical
symbol for
the element
tin?



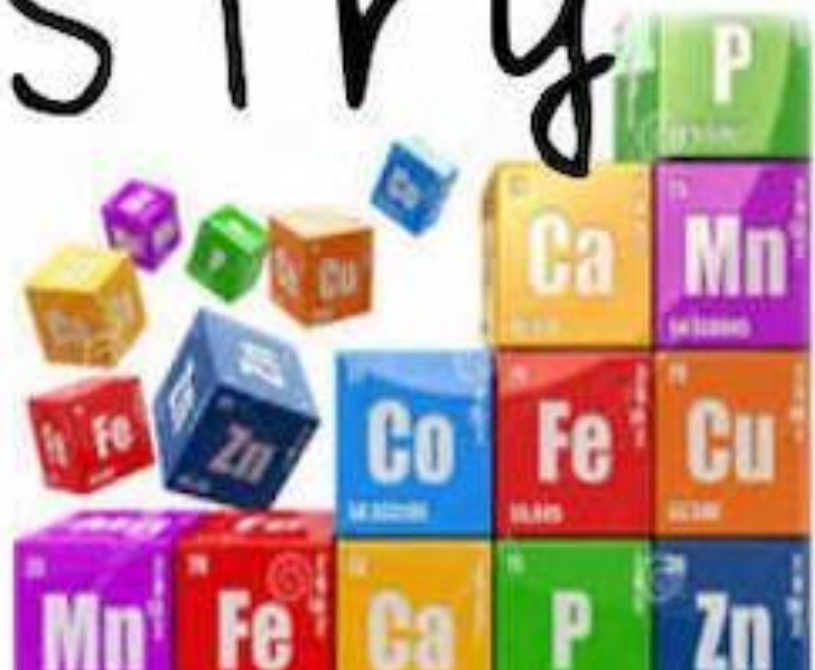
By what **process** does a perfume smell travel through a room?

The EU has agreed a deal for a COVID-19 vaccine with this biopharmaceutical company. Name it.

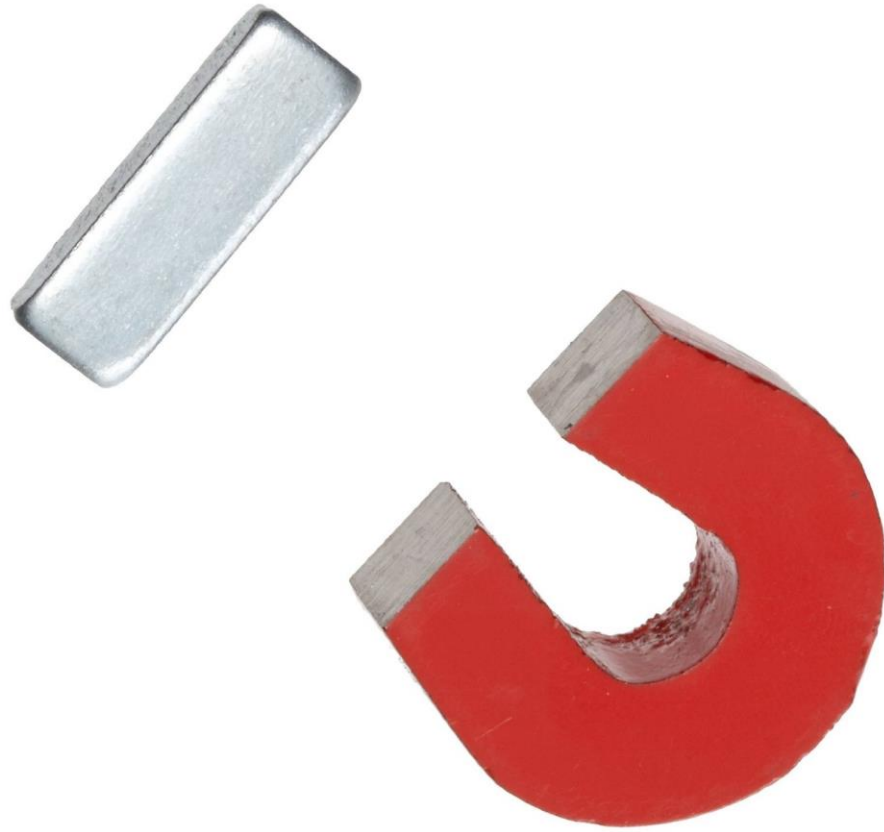




Chemistry



Round 4



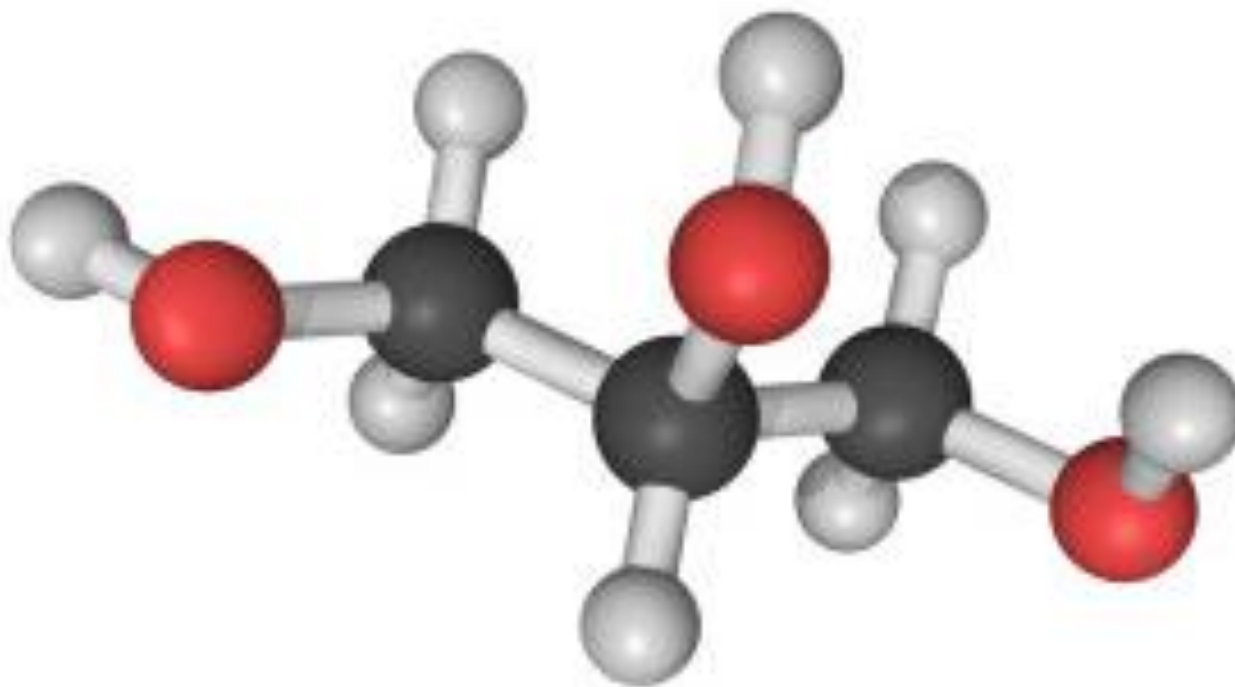
group	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
period 1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	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
6	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
7	87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
lanthanoid series 6	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				
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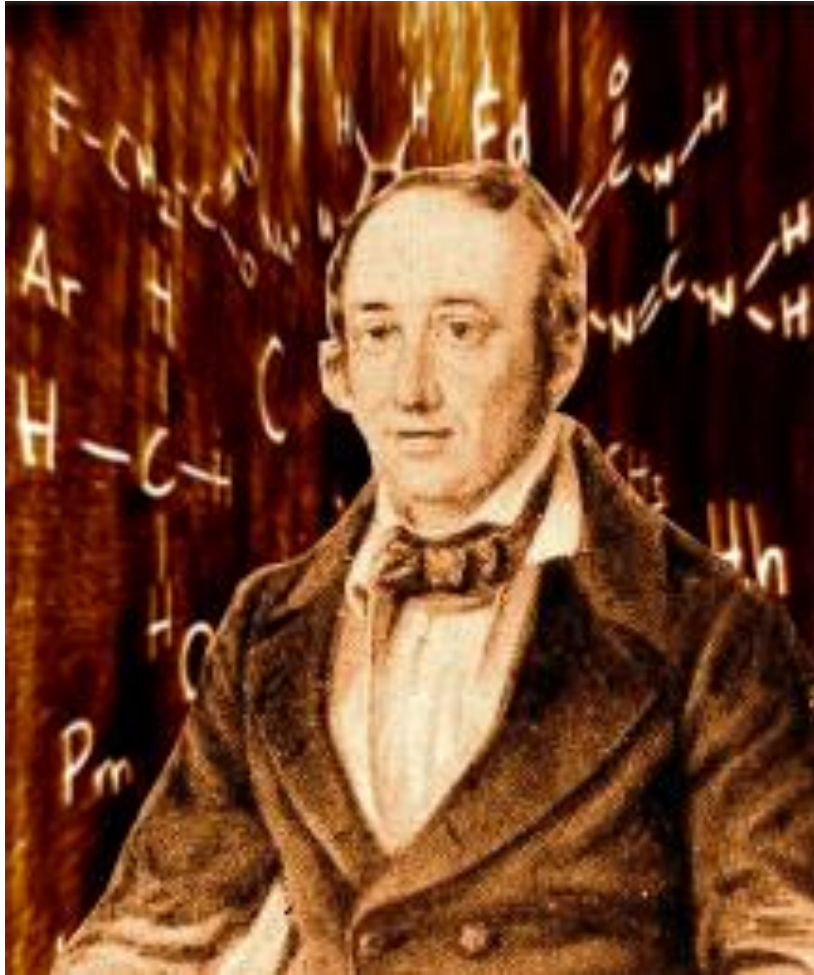
*Numbering system adopted by the International Union of Pure and Applied Chemistry (IUPAC). © Encyclopædia Britannica, Inc.

What are the 3 magnetic elements?

Glycerol is used for weight loss, improving exercise performance and reducing pressure inside the eye in people with glaucoma. It is also a byproduct of **saponification**.

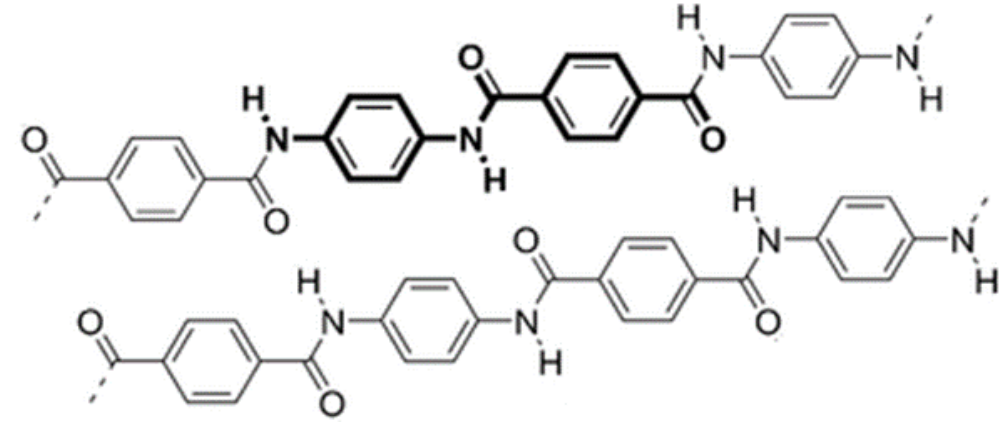
What is its **IUPAC name**?





Name this Swiss-Russian chemist who is regarded as the 'founder of thermochemistry'.

Which intermolecular force is responsible for the strength of Kevlar?

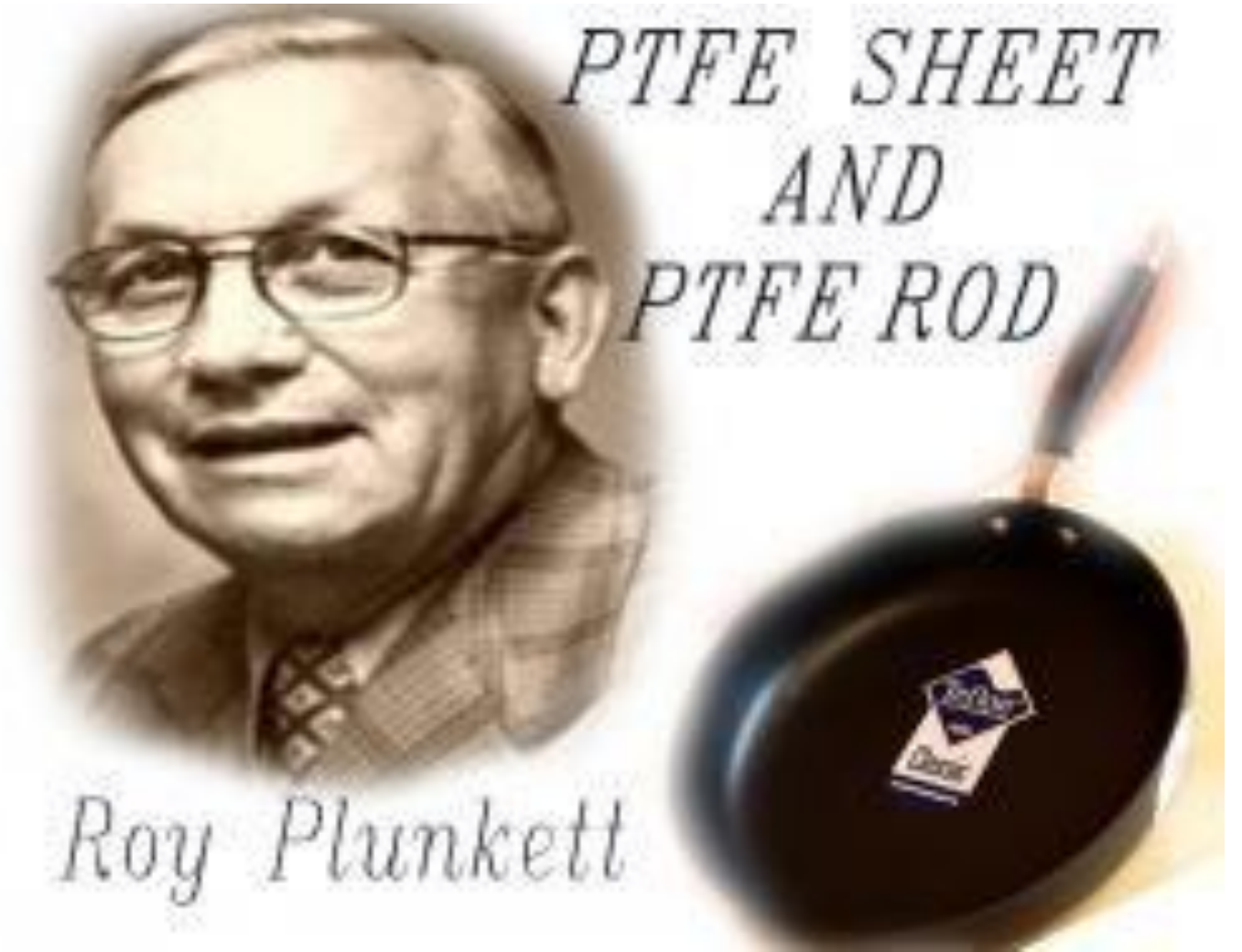


Cellulose acetate is the acetate ester of cellulose. Which **organic acid** is used to make it?



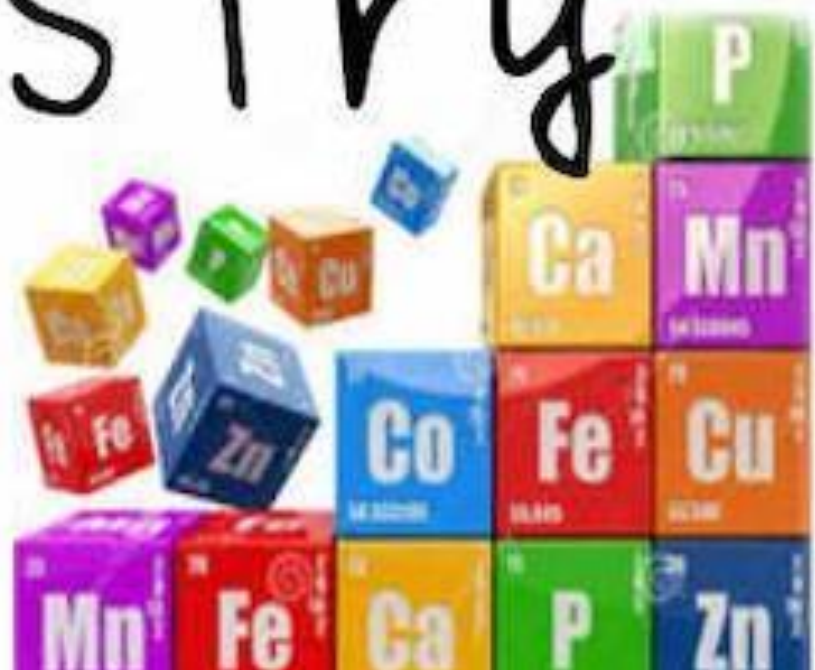
Roy Plunkett
discovered PTFE
(Teflon)

What does **PTFE**
stand for?



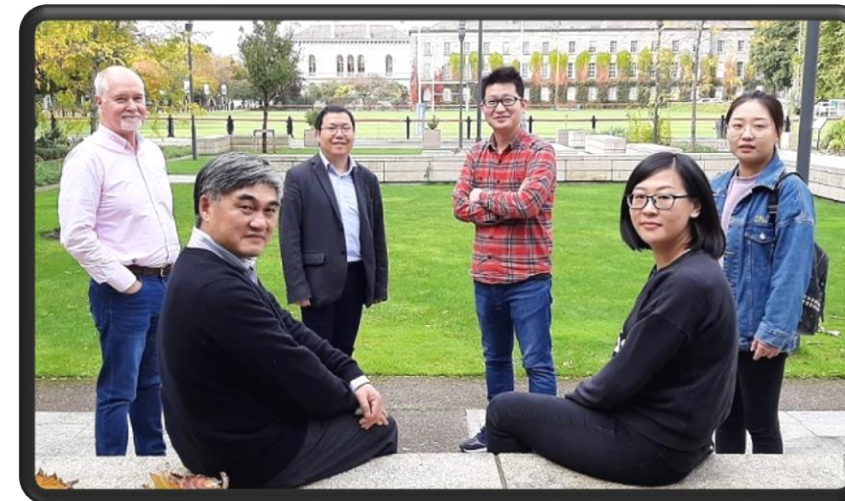


Chemistry



Round 5

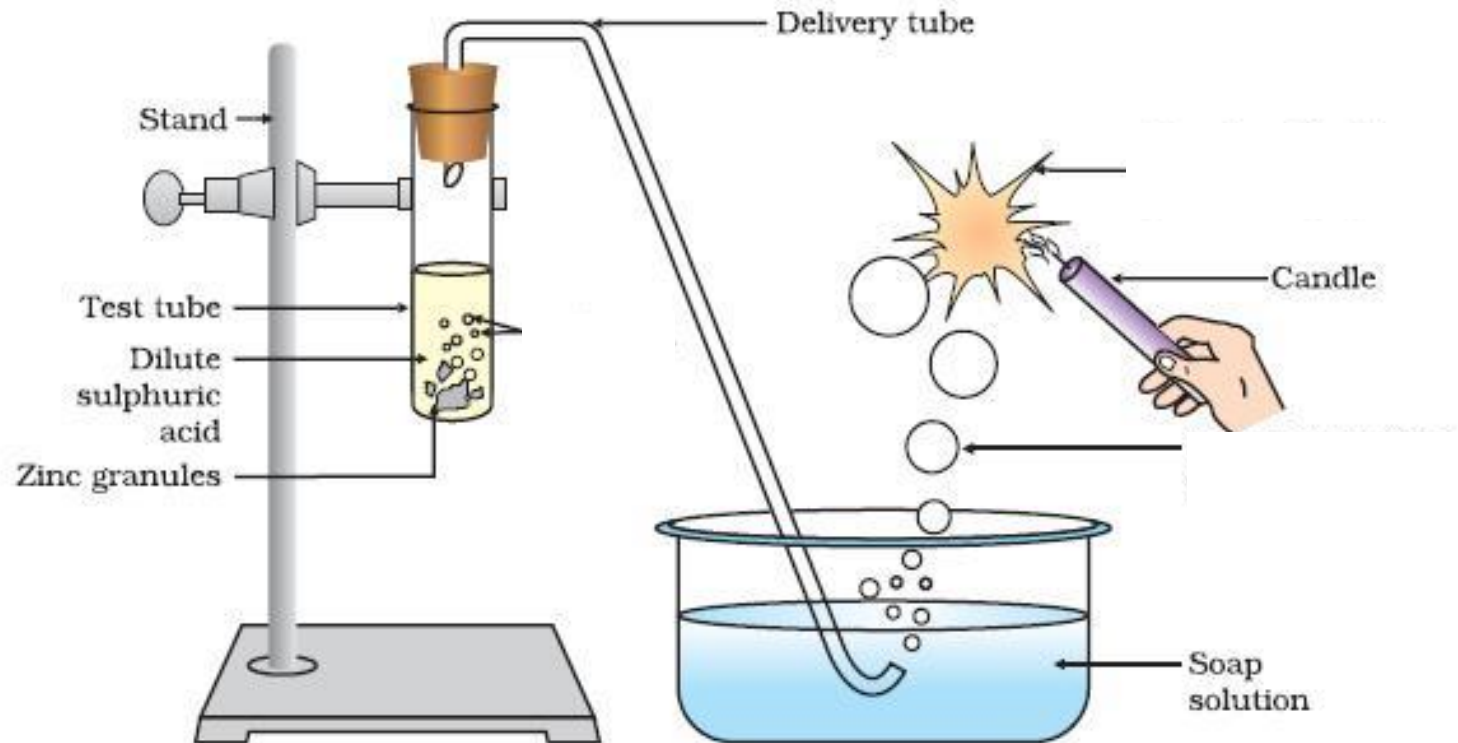
- Recent findings from a study by the Boland Lab in Trinity College into the effects of increased exposure to heated liquids on Infant Feeding Bottles made the headlines.
- On average infants up to 1 year are exposed to 1 million of these per day.
- What are these **small pieces of plastics** known as?



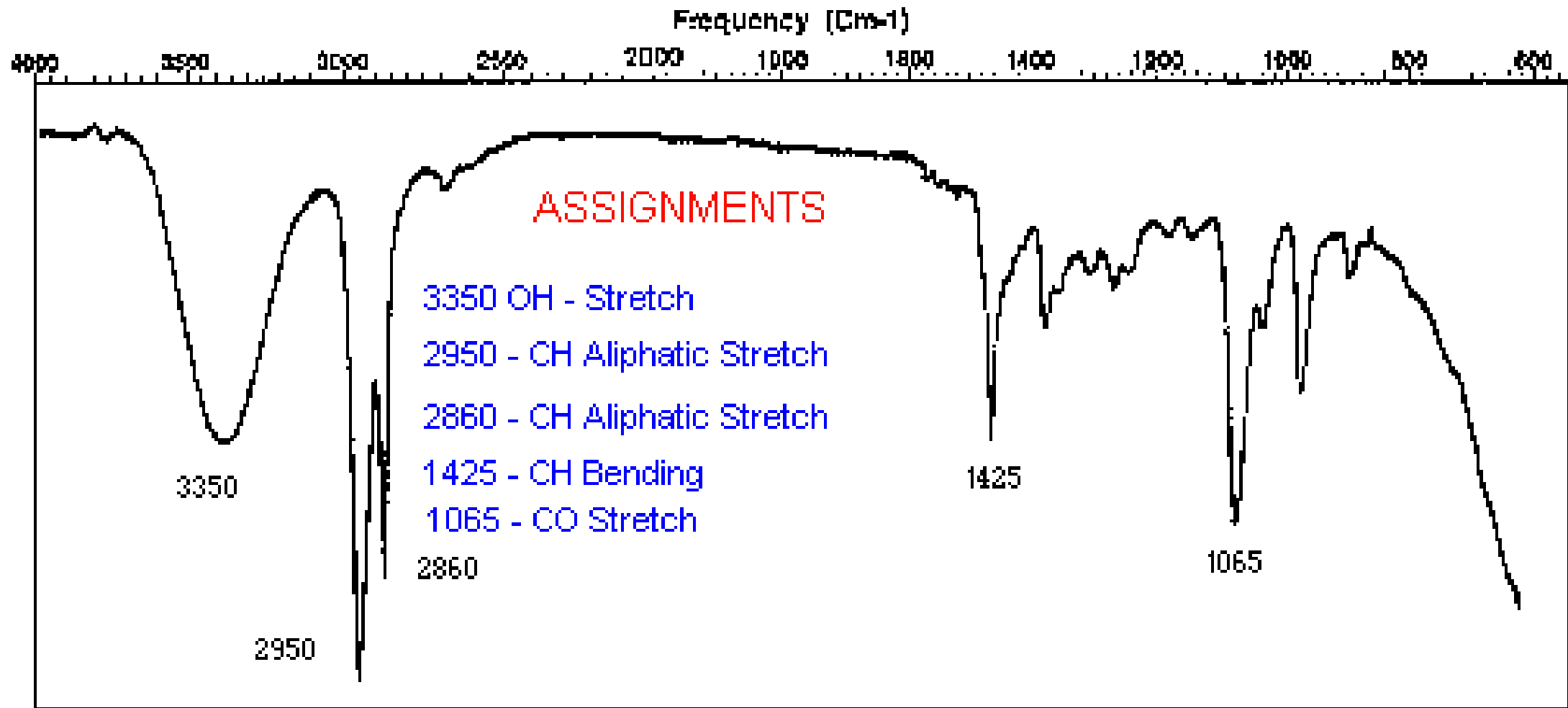


By mass, what is the most abundant **element** in the human body?

Identify the **gas** released when dilute sulfuric acid is dropped on zinc granules.



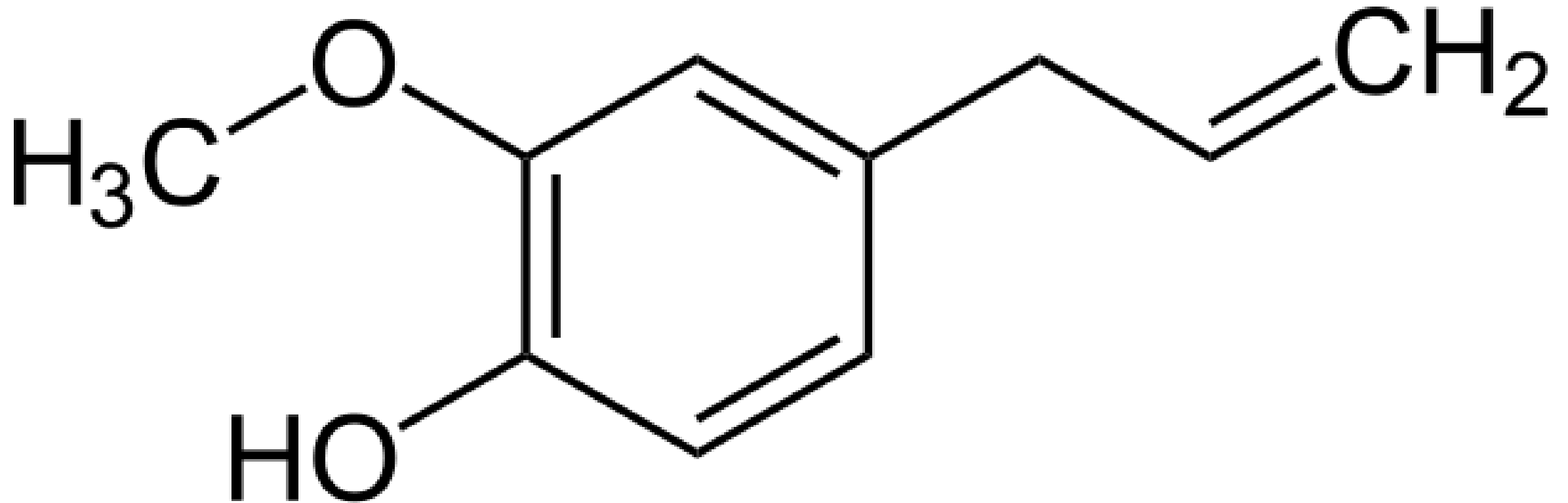
Identify this type of spectrum.





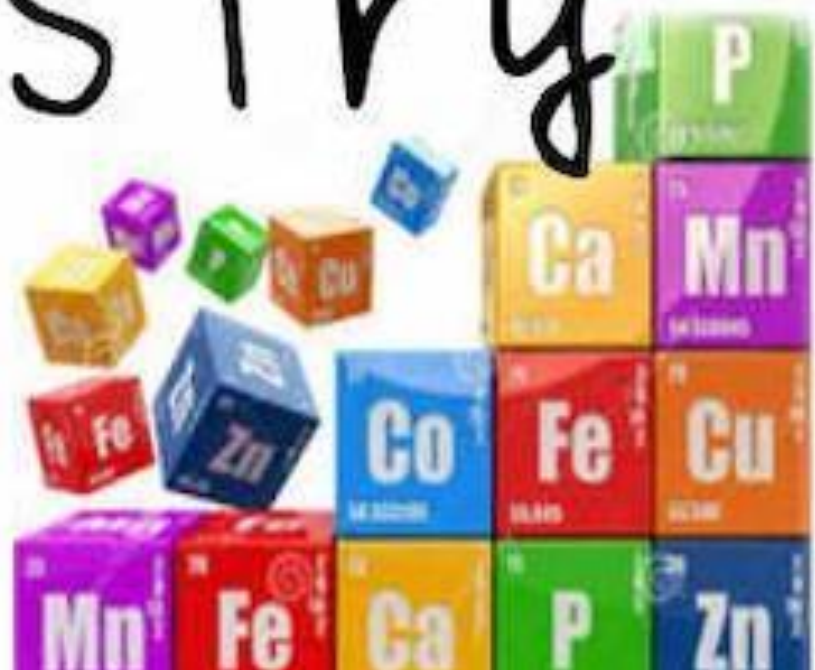
Name the **chemical process** used extensively to **extract oils from plants** such as roses, lavender and cloves.

How many tetrahedral carbons in eugenol?

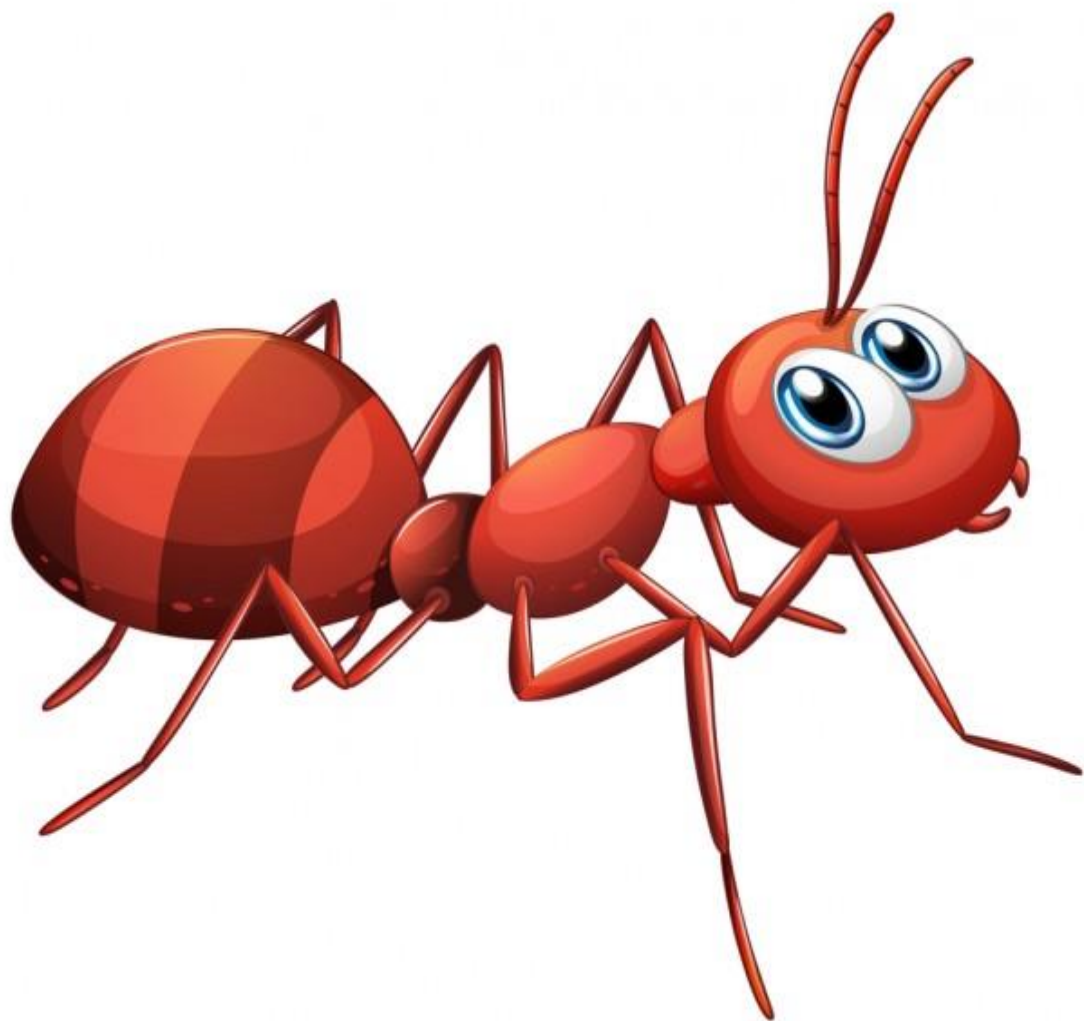




Chemistry



Round 6

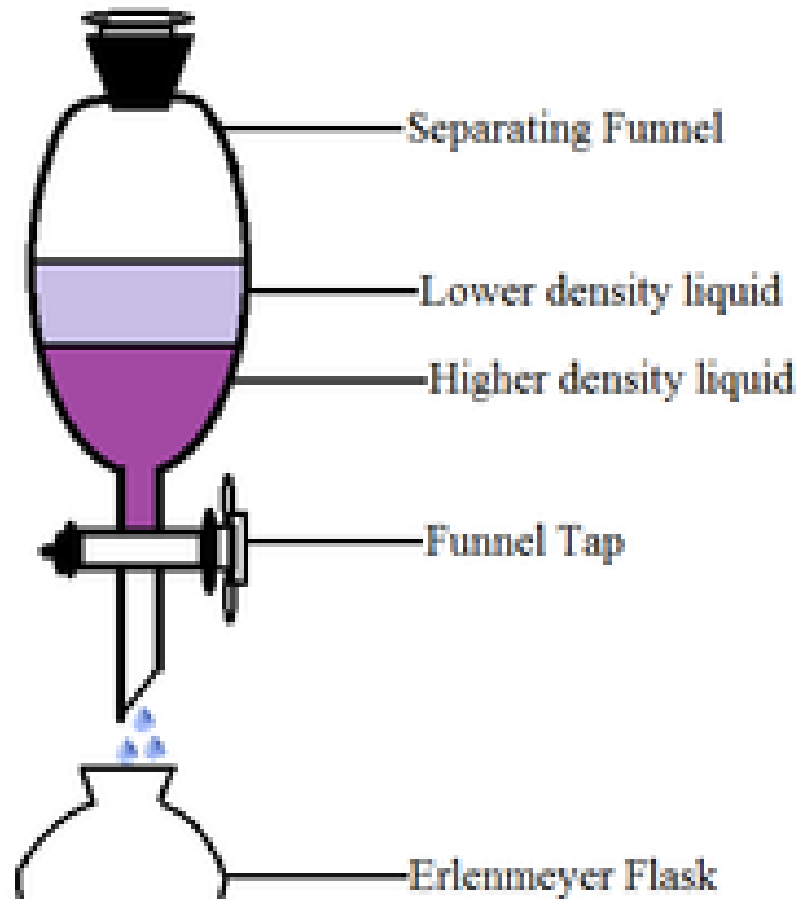


Which organic acid do ants spray in self-defence?

Write a balanced chemical equation for the reaction of
Mg ribbon with acetic acid.

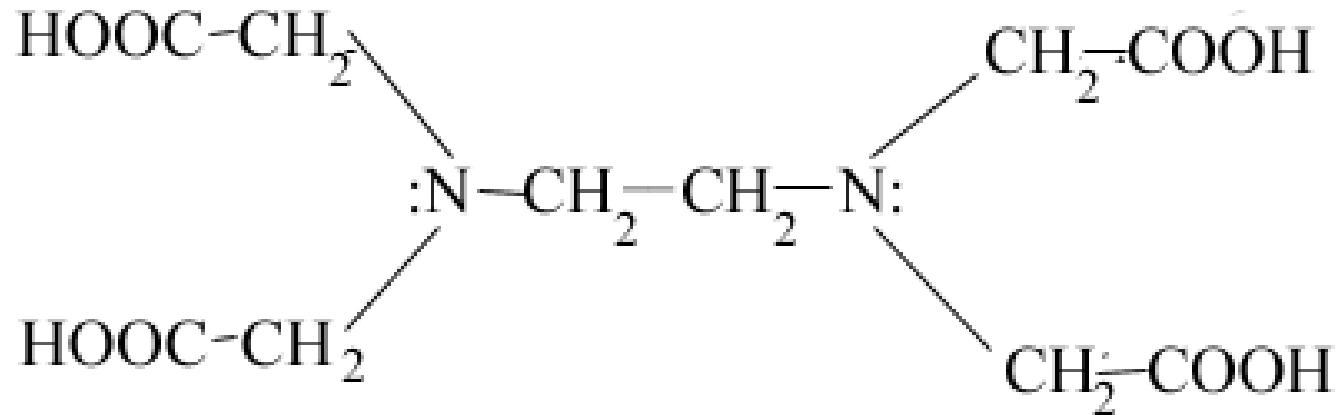


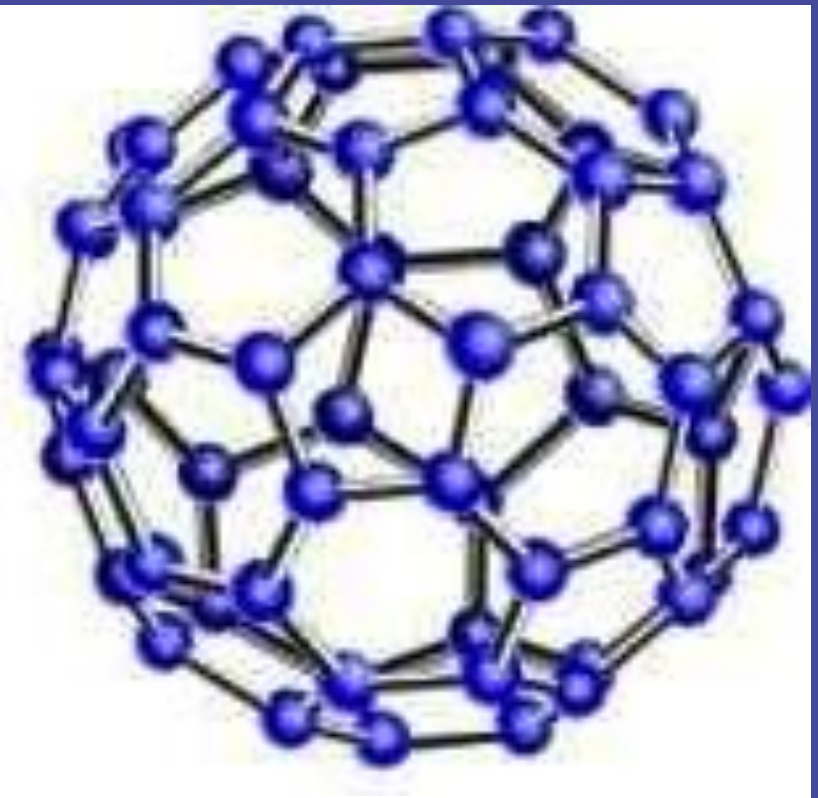
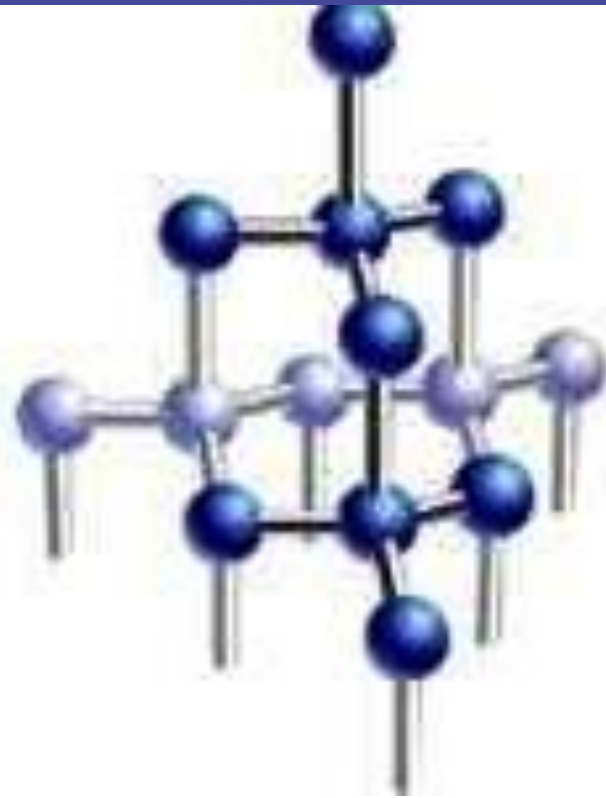
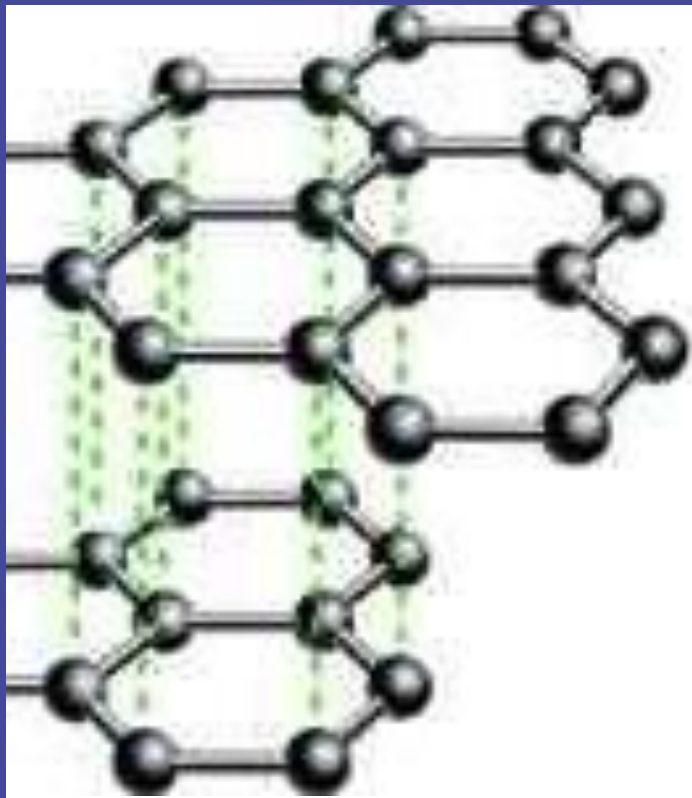
Liquid-liquid Extraction



Name the technique used to extract eugenol from an emulsion of clove oil and water.

EDTA binds to heavy metals and is used to treat acute and chronic lead poisoning by pulling it from the bloodstream.
What does **EDTA** stand for?





Name these three **allotropes** of carbon shown.

Periodic Table of the Elements

	IIA										III A	IV A	V A	VIA	VII A
4	Be										5	6	7	8	9
11	Mg										13	14	15	16	17
	III B	IV B	V B	VIB	VII B	VII		IB	IIB						
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br
38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I
56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85
Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At
88	89	104	105	106	107	108	109	110	111	112	113				
Ra	+Ac	Rf	Ha	Sg	Ns	Hs	Mt	110	111	112	113				

thanide	58	59	60	61	62	63	64	65	66	67	68	69	70	71
es	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
inide	90	91	92	93	94	95	96	97	98	99	100	101	102	103
ies	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Families of Elements

Each element in the periodic table has distinctive properties. When elements have similar properties they are grouped into families.

	Alkali Metals		Alkali Earth Metals		Transition Metals
	Rare Earth Metals		Other Metals		Nonmetals
	Halogens		Noble Gases		Metalloids

Which of the noble gases is most abundant in the atmosphere?



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