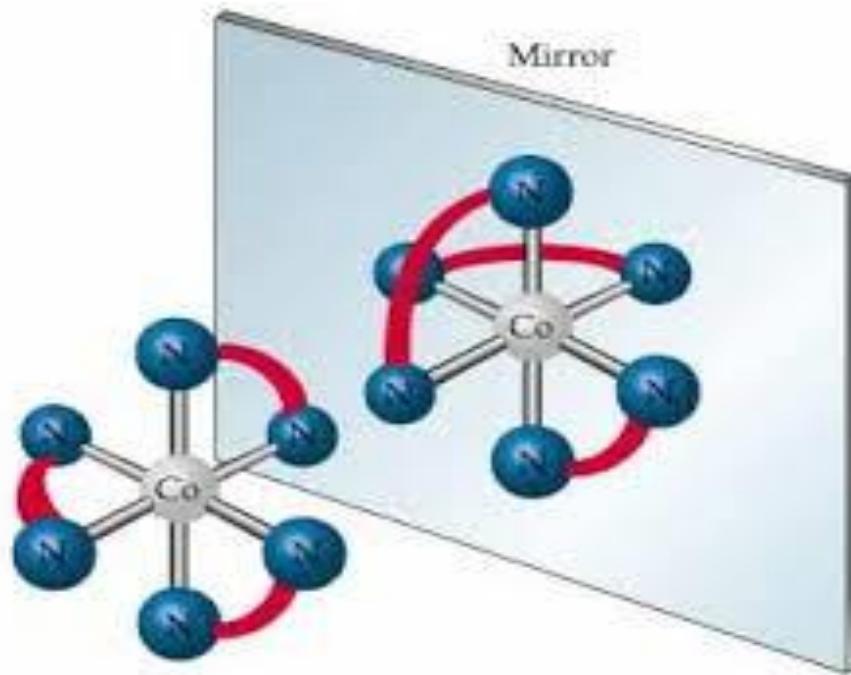


Symmetry Elements

Symmetry element	Symmetry operation	Symbol
axis of rotation	rotation by $360^\circ/n$	C_n
mirror plane	reflection	σ
center of inversion*	inversion	i
improper axis of rotation	rotation of $360^\circ/n$ followed by mirror reflection that is perpendicular to the rotational axis.	S_n

*For S_1 and $S_2 = \sigma$ and i , respectively.

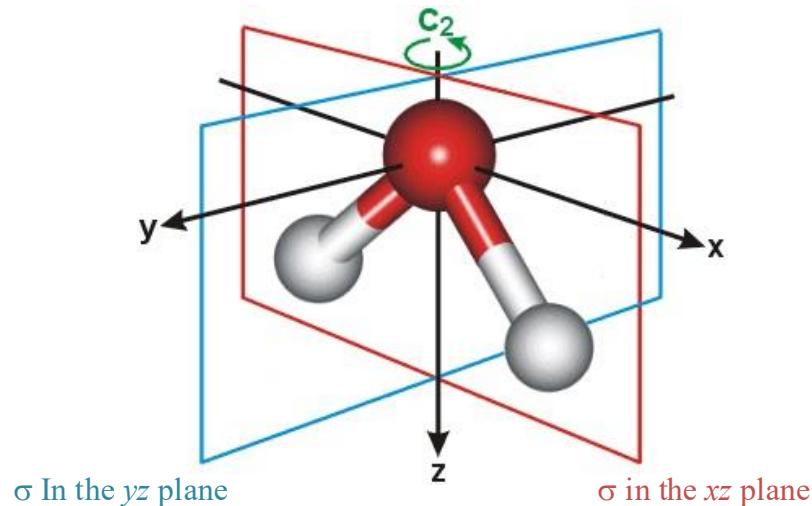


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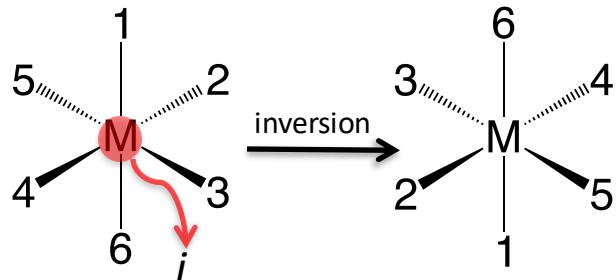
Symmetry elements of water, which has a C_2 axis of rotation and two mirror planes, σ



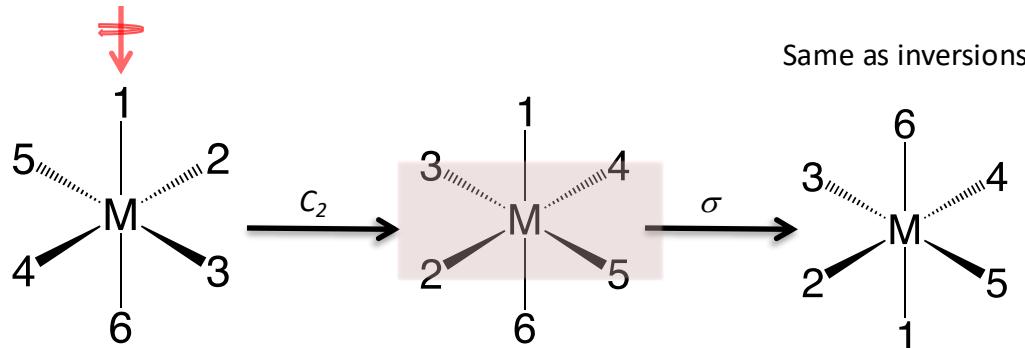
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*For S_1 and $S_2 = \sigma$ and i , respectively.



For S_2 this is a $360^\circ/2$ rotation followed by a mirror perpendicular to the 1-fold rotation axis.

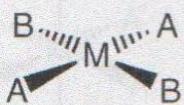


Enantiomers of 4-coordinate complexes

square planar

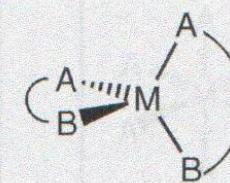
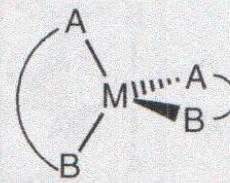
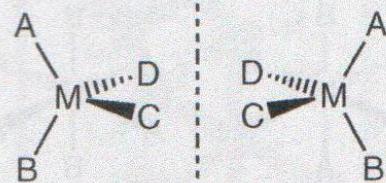


cis



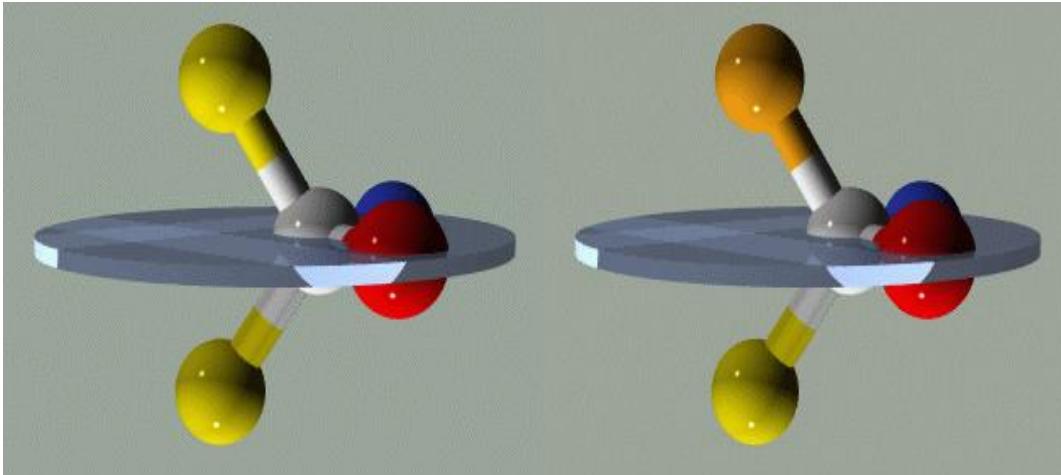
trans

tetrahedral



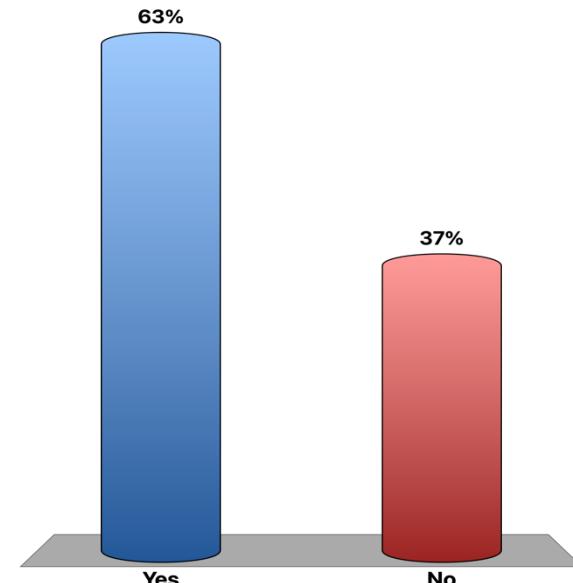
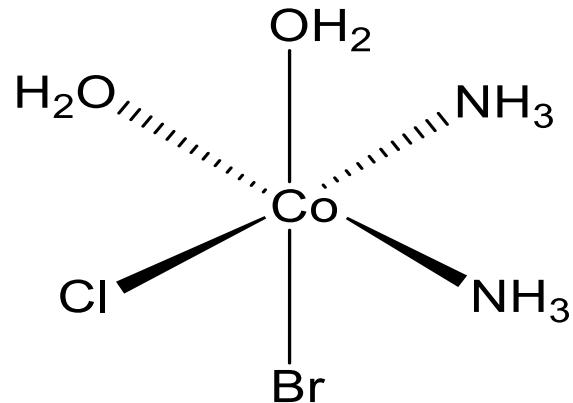
geometric isomers (diastereomers)

optical isomers (enantiomers)
(non-superimposable mirror images)



Does it have an enantiomer?

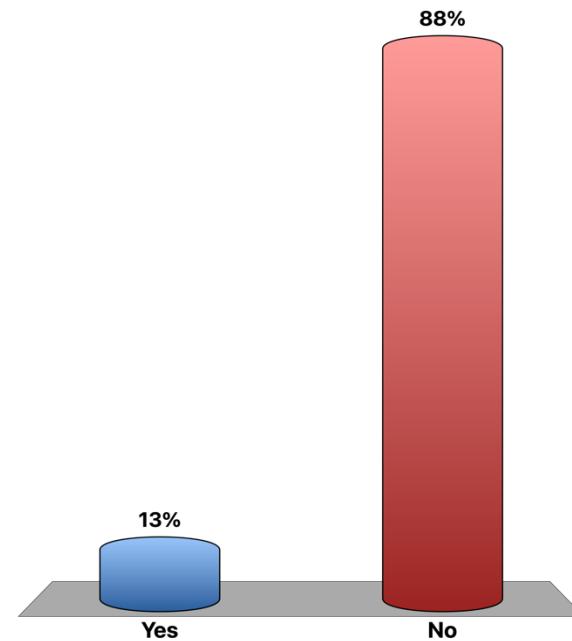
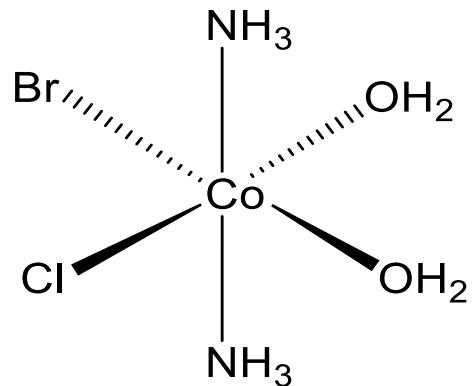
- A. Yes
- B. No



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Access ID: CH222

Does it have an enantiomer?

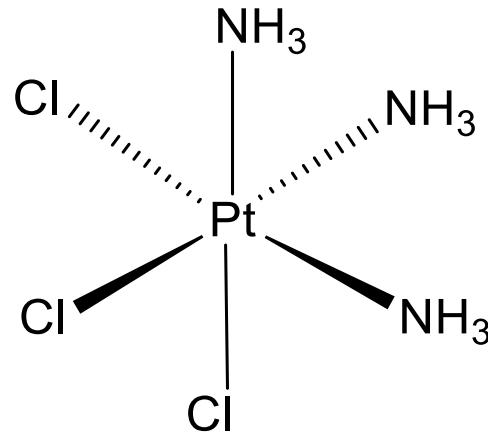
- A. Yes
- B. No



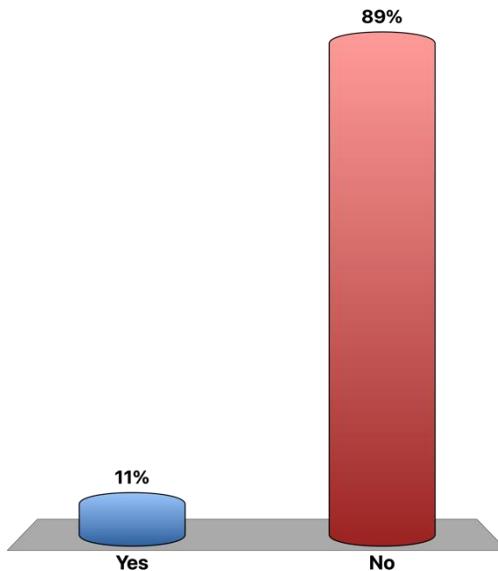
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Access ID: CH222

Is it chiral?

- A. Yes
- B. No



Access: tppoll.eu
Access ID: CH222



Formula	Number of Stereoisomers	Pairs of Enantiomers
Ma_6	1	0
Ma_5b	1	0
Ma_4b_2	2	0
Ma_3b_3	2	0
Ma_4bc	2	0
Ma_3bcd	5	1
Ma_2bcde	15	6
Mabcdef	30	15
$\text{Ma}_2\text{b}_2\text{c}_2$	6	1
$\text{Ma}_2\text{b}_2\text{cd}$	8	2
$\text{Ma}_3\text{b}_2\text{c}$	3	0
M(AA)(BC)de	10	5
M(AB)(AB)cd	11	5
M(AB)(CD)ef	20	10
M(AB)_3	4	2
M(ABA)cde	9	3
M(ABC)_2	11	5
M(ABBA)cd	7	3
M(ABCBA)d	7	3

Uppercase letters represent chelating ligands, and lowercase letters represent monodentate ligands.