

जुलाई 2010

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## Geology

Course Material for UG Sem-I  
CC-02 + PG Sem- -102

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## Elements of Crystallography

Crystallography is the branch of Geology which studies about CRYSTALS, The Origin, Classification, characteristics of Crystals, all these are the subject-matter of Crystallography.

Crystal - Crystal is a polyhedral substance bounded by smooth planes called as 'Face', which develop from liquid or melt during cooling. This process of formation of crystal is called as crystallization.

अप्रैल 2010	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				



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Crystals have both internal atomic structure and external form. First of all internal atomic structure develop followed by external form if Temp. & pressure is favourable.

If only internal atomic structure develop without external form it is a crystalline body. In case during conversion of liquid to solid none of the two develop it is glassy material.

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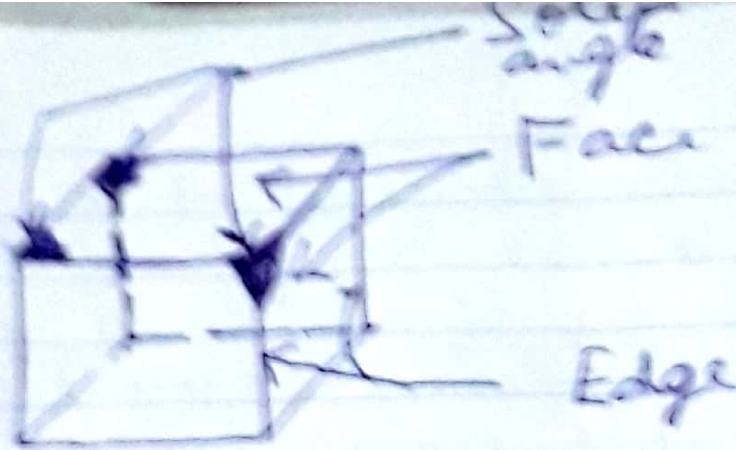
All the crystals are natural mineral but all mineral are not crystal.

Only those mineral are called crystals which acquire both internal atomic structure and corresponding "External Form".

Crystals have specific geometrical form like cube, octahedron, rhomb, hexagon etc. These nature depends up on composition of the mineral and the physico-chemical condition under which they develop.

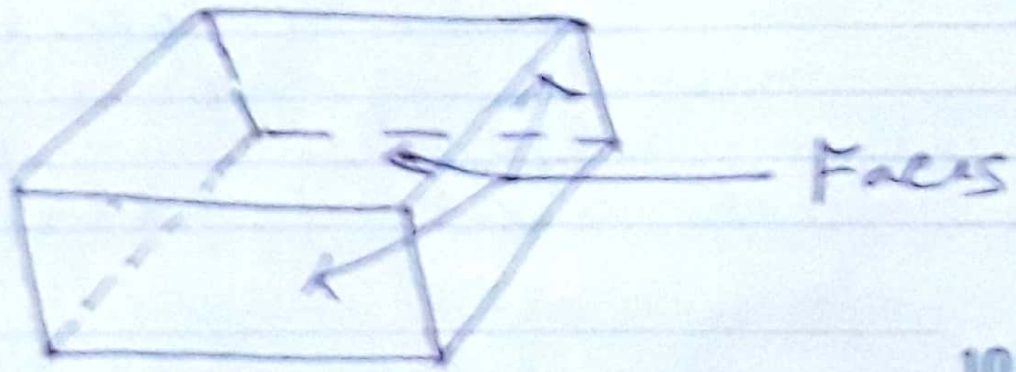
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			





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Fig 1 Cube - A six square shaped faced crystal.



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Fig 2 A rhombic crystal

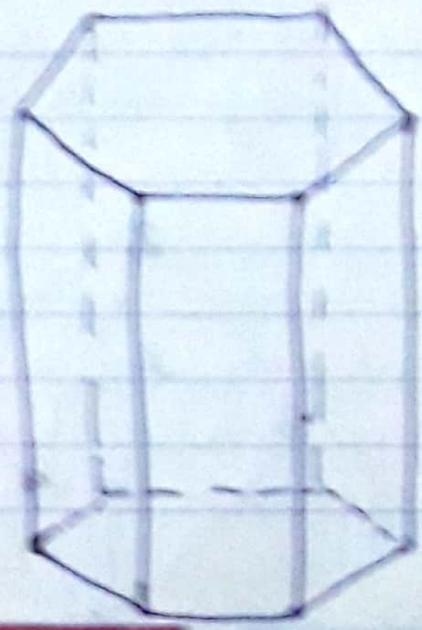


Fig-3 - A Hexagonal crystal.

01	02	03	04	05	06	07	08	09	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



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Each crystal has specific geometrical shape which is made up of a no. of faces. Crystals have their typical shape of faces and their number too. Faces are made up of edges, when two faces meet or intersect they form an edge. Each face is made of specific number of faces.

Where two or more faces meet together they form solid angle.

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No. of faces, solid angles and edges varies in different crystals.

eg. - Cube has 6 square shaped faces, 12 edges and 8 solid angles

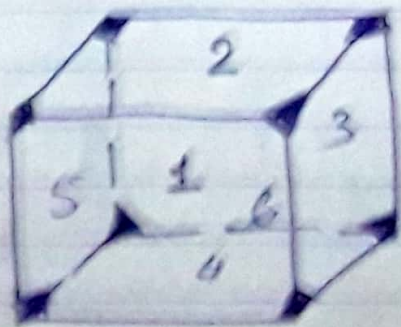


Fig-4 - Cube Crystal

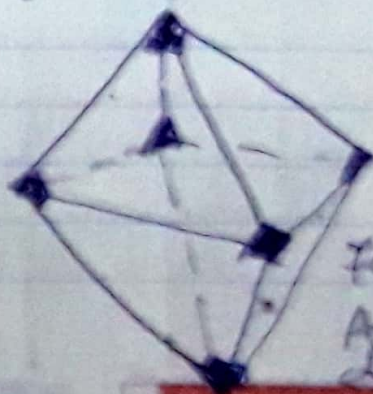


Fig-5 An Octahedron Crystal

An Octahedron has 8 triangular faces, 12 edges and 6 solid angles.

Face	1	2	3	4	5
1	6	12	18	24	30
2	12	24	36	48	60
3	18	36	54	72	90
4	24	48	72	96	120
5	30	60	90	120	150