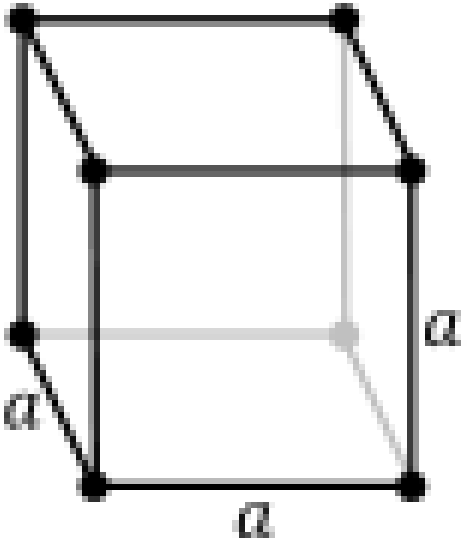
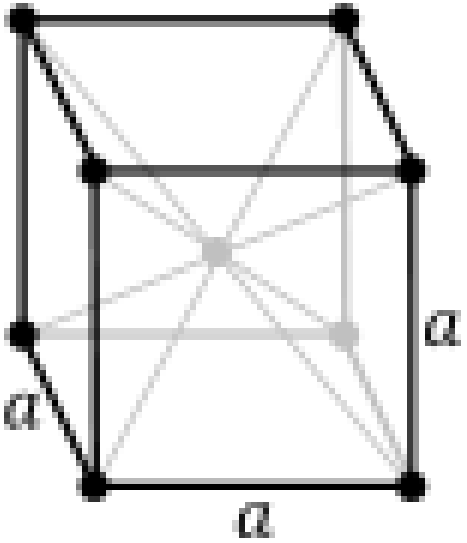
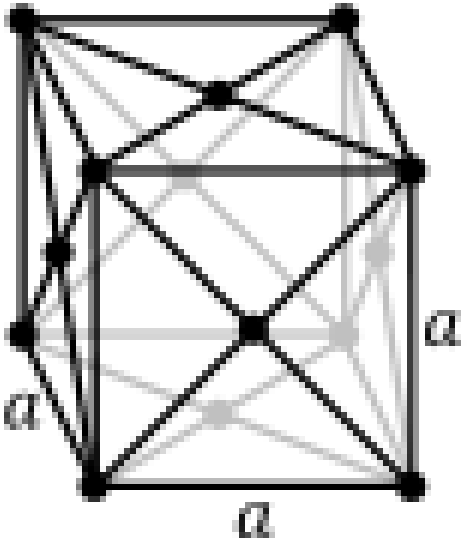
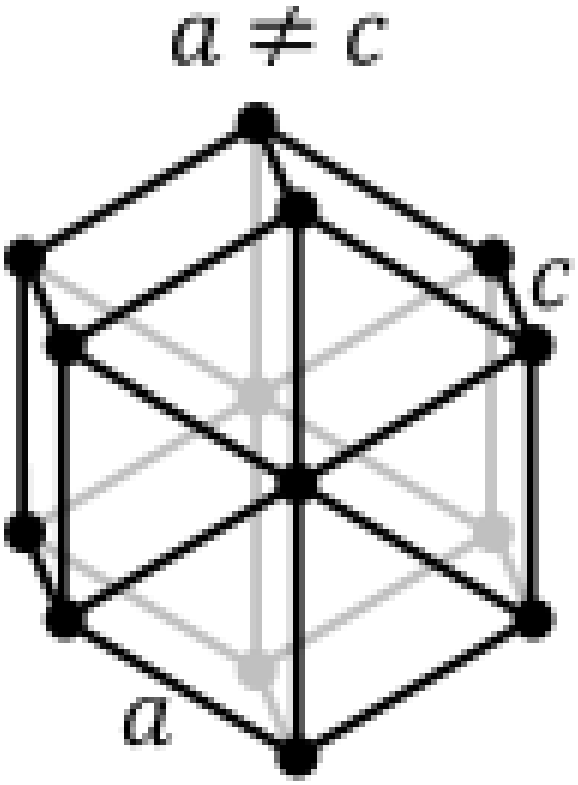
Kubični







Heksagonski



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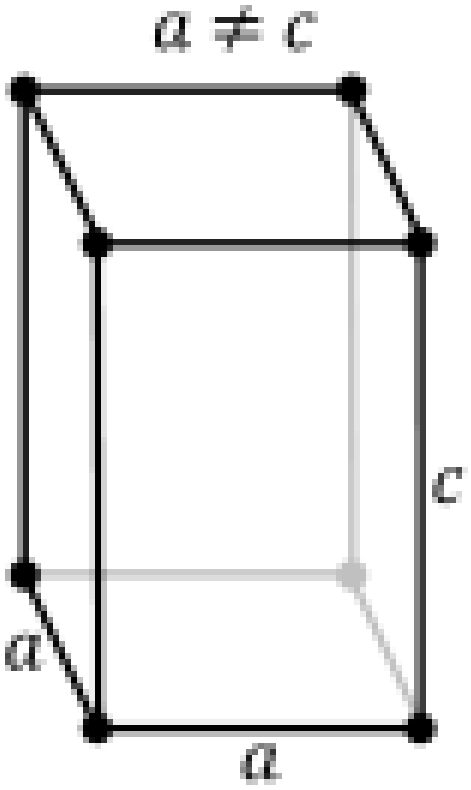
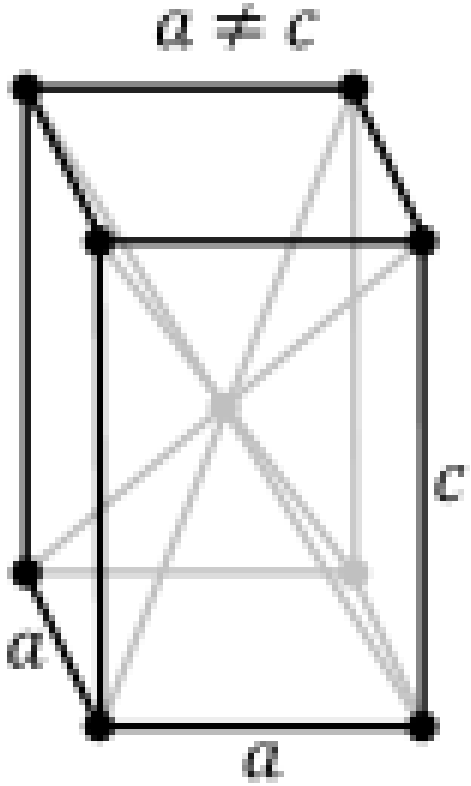
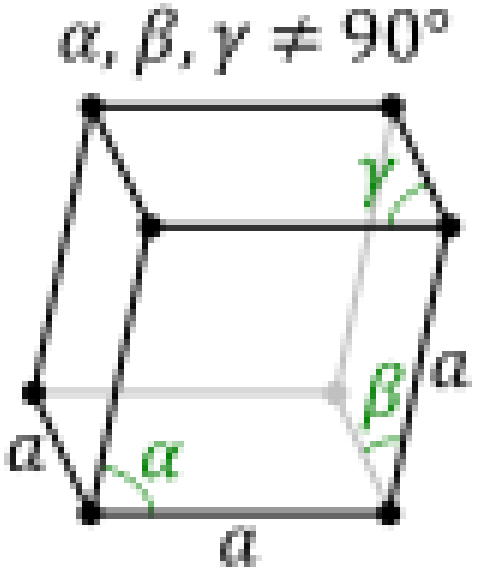
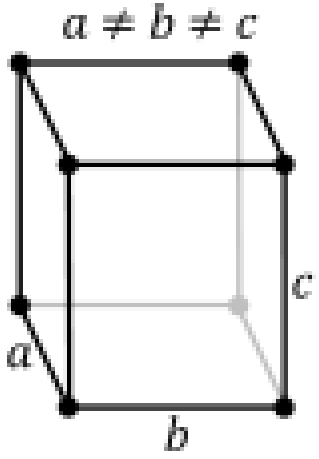


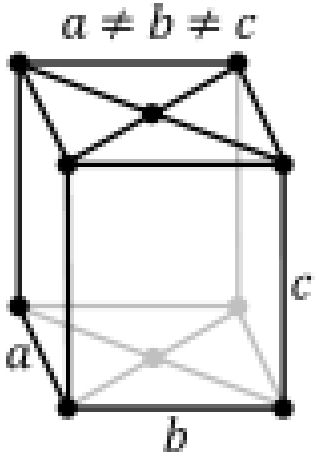


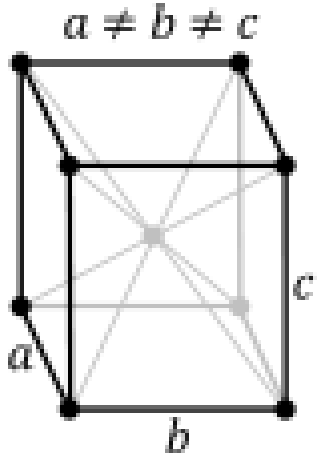
Romboedarski

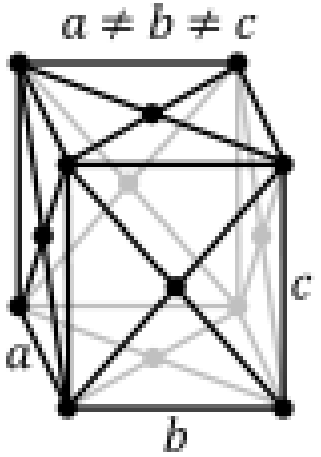


Ortoromski





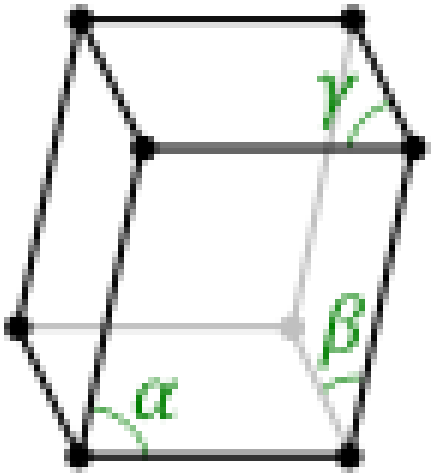




Kristalni sustavi

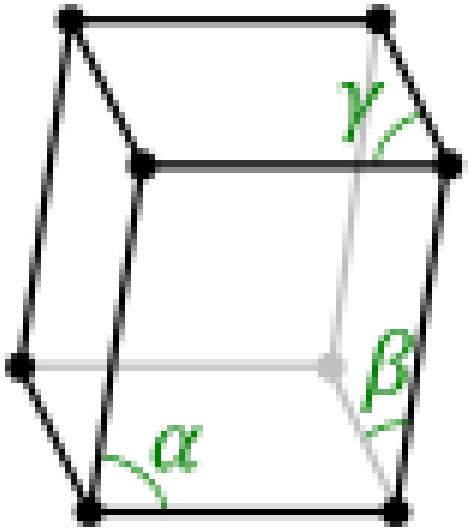
Triklinski

$\alpha, \beta, \gamma \neq 90°$

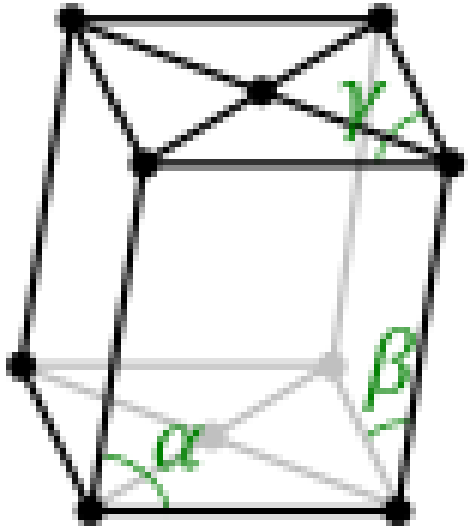


Monoklinski

$\alpha \neq 90°$
$\beta, \gamma = 90°$



$\alpha \neq 90°$
$\beta, \gamma = 90°$



Vektori recipročne rešetke

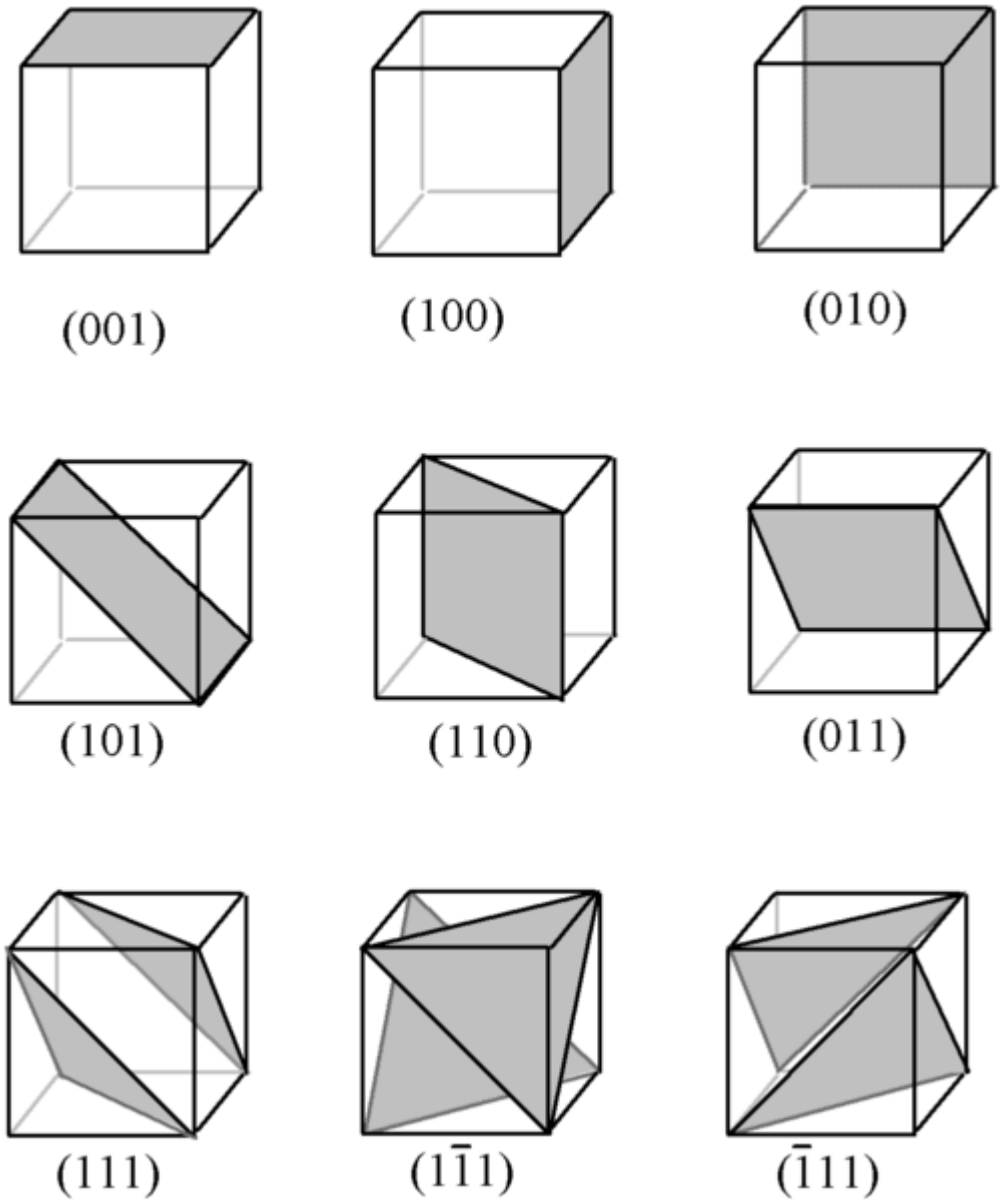
$$\ell \mathbf{a}_1 + m\mathbf{a}_2 + n\mathbf{a}_3 .$$

$$\mathbf{b_1} = 2\pi \frac{\mathbf{a_2} \times \mathbf{a_3}}{\mathbf{a_1} \cdot (\mathbf{a_2} \times \mathbf{a_3})}$$

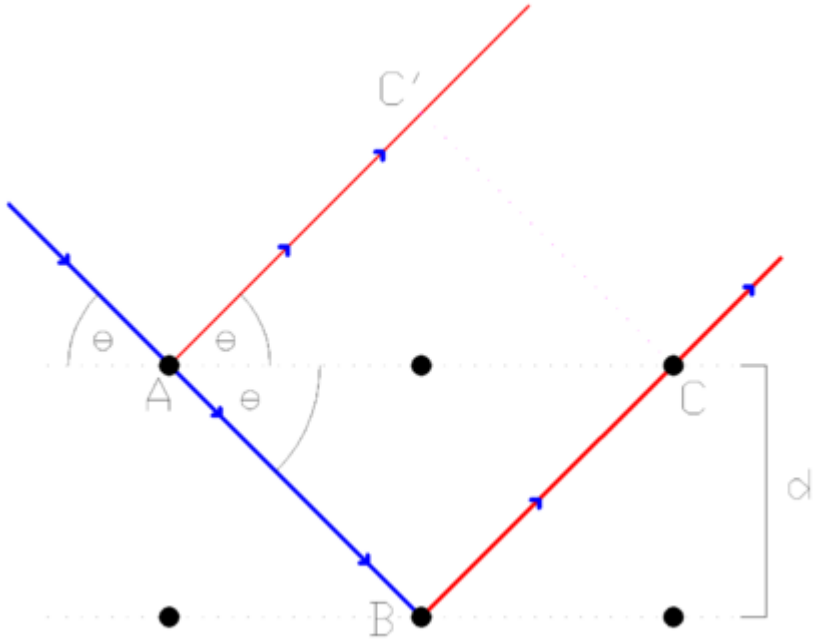
$$\mathbf{b_2} = 2\pi \frac{\mathbf{a_3} \times \mathbf{a_1}}{\mathbf{a_2} \cdot (\mathbf{a_3} \times \mathbf{a_1})}$$

$$\mathbf{b_3} = 2\pi \frac{\mathbf{a_1} \times \mathbf{a_2}}{\mathbf{a_3} \cdot (\mathbf{a_1} \times \mathbf{a_2})}$$

Millerovi indeksi

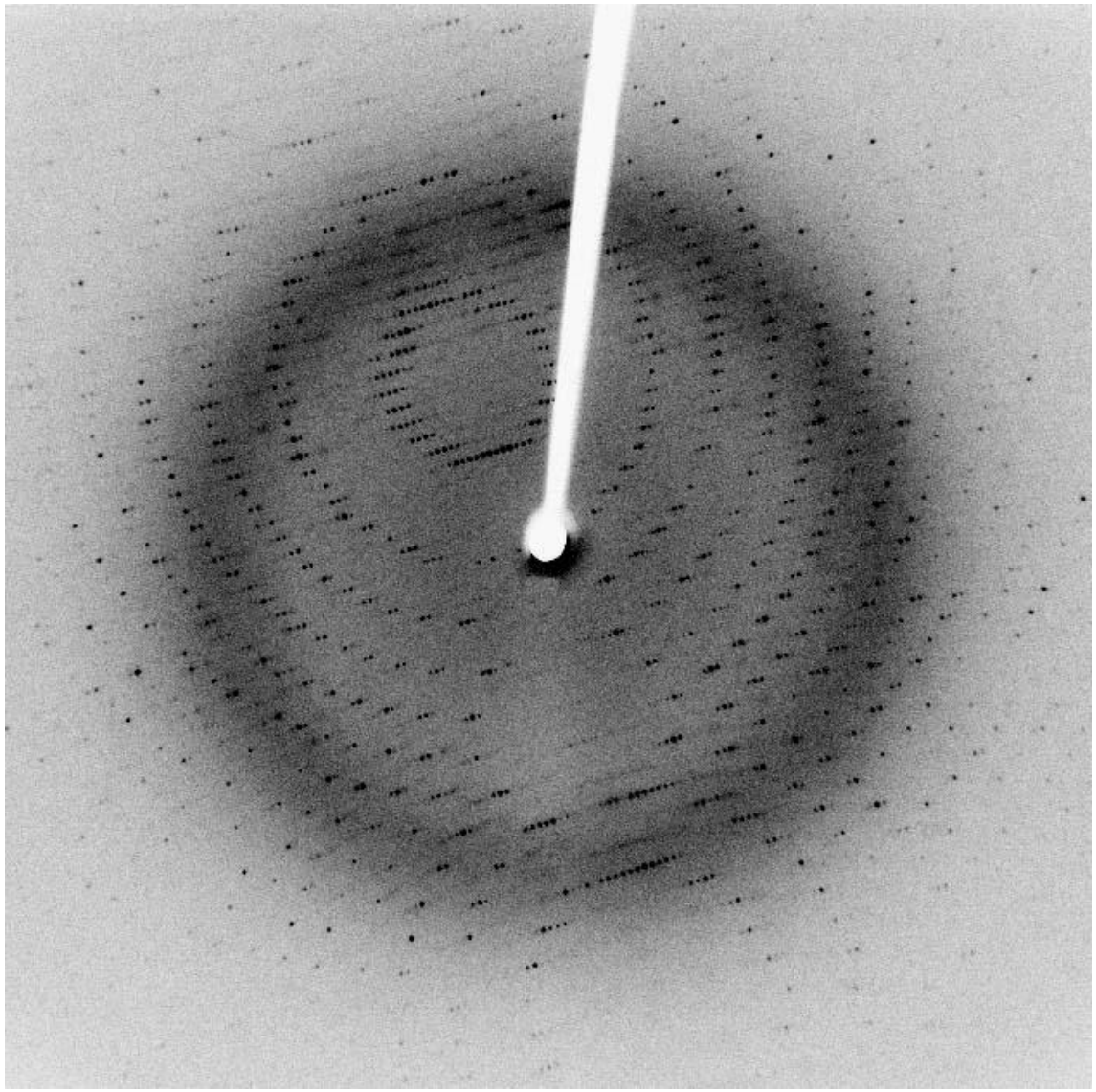


Braggov zakon



$$n\lambda = 2d \cdot \sin\theta$$

XRF Spectrometer

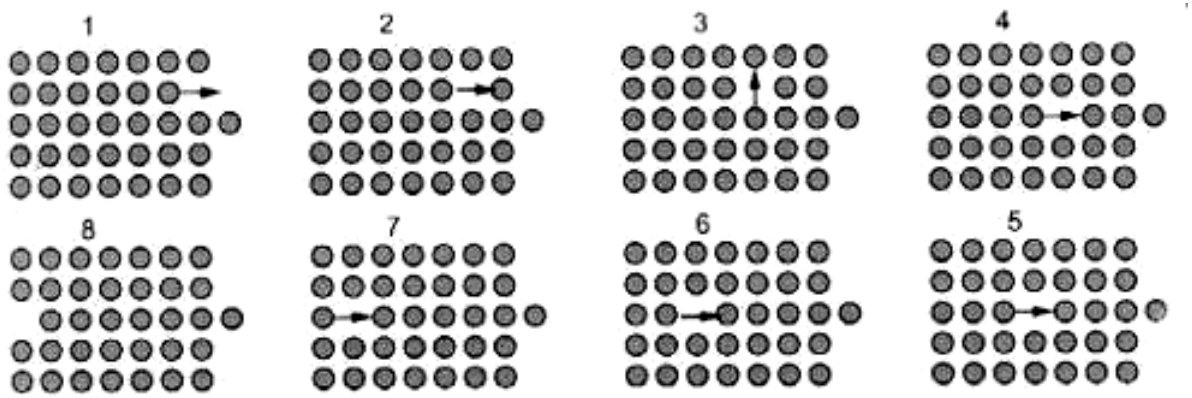


Dinamički defekti/pogreške/nepravilnosti kristalne rešetke
nastaju pobuđivanjima kristalne rešetke
fononi-kvanti titranja kristalne rešetke
magnoni-kvanti spinskih valova u feromagnetima i antiferomagnetima
plazmoni-kvantizirani valovi plazme sastavljeni od elektrona ili šupljina
polaritoni-složena osnovna (elementarna) pobuđenja
uključuju fotone; primjerice, oni mogu nastati interakcijom fotona s fononima
ili eksitonima,
polaroni- kvantizirani polarizacijski valovi
eksitoni-vezana električno neutralna stanja elektrona i šupljina

Statički defekti
pogreške su nepravilnosti geometrijske strukture kristala
nastale pri konstrukciji kristalne rešetke ili kasnijim postupcima
(mehaničkim deformacijama, grijanjem, zračenjem, i drugo

Statički defekti se klasificiraju prema svojim dimenzijama na:
"0"-dimenzijski ili točkasti defekti: praznine, interstijski atomi….,
"jednodimenzijski" ili linijski defekti: dislokacije, odgovorne za mehanička svojstva,
"dvodimenzijski" defekti: granice zrna i površine kristala,
"trodimenzijski" ili volumni defekti: pukotine, rupe u kristalu, strana tijela –inkluzije.

Stvaranje praznine možemo zamisliti na dva načina:
a) atom odlazi iz regularnog mjesta rešetke na površinu i iza sebe ostavlja prazno mjesto. Takav par (atom na površini+praznina) zove se **Schottkyev defekt (dominantni defekt).**
Na slici prikazano je stvaranje Schottkyevog defekta i dinamika gibanja praznine.



$$N_s = Ne^{-\frac{E_s}{Tk_B}}$$

b) ako intersticijski atom nastane pomakom vlastitog atoma iz regularnog položaja, gdje ostaje praznina dobivamo t.z. **Frenkelov defekt**

$$N_f = \sqrt{NN^*}Ne^{-\frac{E_f}{2Tk_B}}$$

N_f<<N,N; N* je broj intersticijskih položaja*