$Ba_3Fe(Fe_{0.5}Te_{0.5})_2O_9$	*hP*30	(182) $P6_322$ – ihf^{2}ba

$Ba_3Fe_2TeO_9$ [1], perovskite 6H
Structural features: Close-packed BaO_3 layers in hc_2 stacking; Fe and (Fe,Te) in octahedral (O_6) voids. Pairs of face-linked (Fe,Te)O_6 octahedra ($(Fe,Te)_2$ dumbbells) share vertices with single FeO_6 octahedra to form a 3D-framework.

Gagulin V.V. et al. (1978) [1]
$Ba_3Fe_2O_9Te$
a = 0.5804, c = 1.413 nm, c/a = 2.435, V = 0.4122 nm^3, Z = 2

site	Wyck.	sym.	x	y	z	occ.	atomic environment
O1	12*i*	1	0.343	0.159	0.081		non-colinear Fe_2
O2	6*h*	..2	0.514	0.028	$^1/_4$		non-colinear Fe_2
Ba3	4*f*	3..	$^1/_3$	$^2/_3$	0.093		cuboctahedron O_{12}
M4	4*f*	3..	$^1/_3$	$^2/_3$	0.649		octahedron O_6
Ba5	2*b*	3.2	0	0	$^1/_4$		anticuboctahedron O_{12}
Fe6	2*a*	32.	0	0	0		octahedron O_6

M4 = 0.5Fe + 0.5Te
Transformation from published data: -*x*,-*y*,-*z*
Experimental: powder, diffractometer, neutrons, R_B = 0.080

Remarks: The structure was also refined in space group (194) $P6_3/mmc$ (R = 0.089).

References: [1] Gagulin V.V., Fadeeva N.V., Belous A.G., Titov A.V., Mitrofanov K.P., Plotnikova M.V., Soloviev S.P., Venevtsev Y.N. (1978), Phys. Status Solidi A 48, 183-189.