SYNTHESIS AND X-RAY DIFFRACTION STUDY OF $Bi_9ATi_7BO_{30}$ (A=Ca, Sr, Pb; B=Cr, Co, Ni, Ga)

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The structures of seven new perovskite-related oxides with the general composition $Bi_9ATi_7BO_{30}$ (A=Ca, Sr, Pb; B=Cr, Co, Ni, Mn, Ga) belonging to the family of Aurivillius phases have been obtained via conventional two-stage solid-state reaction and examined by X-ray diffraction. The structure of the oxides is composed of (Bi_2O_2) layers interleaved with four perovskite-like layers. All the diffraction patterns were indexed in the orthorhombic $A2_1am$ space group except the one of $Bi_9CaTi_7CrO_{30}$ which was found to be consistent with Fmmm symmetry. The cell parameters obtained as a result of the refinement are listed below. The dependence of the cell parameters on the composition will be analyzed and discussed.

	Composition	Space group	a(Å)	b(Å)	c(Å)	V(Å^3)
1	$Bi_9CaTi_7CrO_{30}$	Fmmm	5.419(3)	5.421(3)	40.705(1)	1195.8
2	$Bi_9CaTi_7NiO_{30}$	$A2_1am$	5.4368(1)	5.4428(3)	40.7982(9)	1207.3
3	$Bi_9CaTi_7CoO_{30}$	$A2_1am$	5.4188(1)	5.4394(2)	40.8800(4)	1204.9
4	$Bi_9CaTi_7GaO_{30}$	$A2_1am$	5.4102(1)	5.4616(2)	40.9001(2)	1208.5
5	$Bi_9SrTi_7NiO_{30}$	$A2_1am$	5.4239(3)	5.4358(3)	40.9797(1)	1208.2
6	$Bi_9PbTi_7CrO_{30}$	$A2_1am$	5.4240(2)	5.4320(1)	41.0437(1)	1209.3
7	$Bi_9PbTi_7MnO_{30}$	$A2_1am$	5.4244(1)	5.4402(2)	41.2051(3)	1215.9