



Tools	Tools from the Eneolithic period									
Sample	1	1	1	2	2	3	3	4	4	4
TiO <sub>2</sub>	0.00	0.00	0.08	0.16	0.18	0.00	0.00	0.00	0.65	0.09
Al <sub>2</sub> O <sub>3</sub>	0.00	30.20	3.76	0.04	19.99	0.00	0.04	0.04	0.11	22.41
Fe <sub>2</sub> O <sub>3</sub> *	67.70	1.71	32.24	64.11	5.13	65.84	40.10	57.47	31.36	1.77
V <sub>2</sub> O <sub>3</sub>	0.07	0.21	0.14	0.00	0.47	0.00	0.00	0.00	0.00	0.14
Cr <sub>2</sub> O <sub>3</sub>	0.55	37.31	30.91	4.38	41.81	2.87	26.76	10.64	35.33	43.00
FeO *	29.86	17.61	27.72	30.20	25.00	29.97	27.36	28.85	26.64	21.83
MgO	0.17	12.10	0.98	0.28	5.35	0.06	0.29	0.06	0.48	5.33
ZnO	0.00	0.28	0.50	0.00	1.56	0.00	0.69	0.44	1.17	4.40
MnO	0.06	0.27	1.70	0.11	0.74	0.10	1.74	0.94	3.07	1.90
NiO	0.55	0.09	0.36	0.44	0.05	0.83	0.49	0.64	0.43	0.00
Total	98.95	99.78	98.39	99.71	100.27	99.67	97.47	99.08	99.24	100.87
<i>apfu</i>										
Ti	0.000	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.020	0.000
Al	0.000	1.070	0.170	0.000	0.770	0.000	0.000	0.000	0.010	0.850
Fe <sup>3+</sup>	1.980	0.040	0.910	1.860	0.130	1.910	1.180	1.670	0.900	0.040
V <sup>3+</sup>	0.000	0.010	0.000	0.000	0.010	0.000	0.000	0.000	0.000	0.000
Cr	0.020	0.890	0.920	0.130	1.080	0.090	0.820	0.330	1.060	1.100
A subtotal	2.000	2.010	2.000	2.000	1.990	2.000	2.000	2.000	1.990	1.990
Fe <sup>2+</sup>	0.970	0.440	0.870	0.970	0.680	0.970	0.890	0.930	0.850	0.590
Mg	0.010	0.540	0.060	0.020	0.260	0.000	0.020	0.000	0.030	0.260
Zn	0.000	0.010	0.010	0.000	0.040	0.000	0.020	0.010	0.030	0.110
Mn	0.000	0.010	0.050	0.000	0.020	0.000	0.060	0.030	0.100	0.050
Ni	0.020	0.000	0.010	0.010	0.000	0.030	0.020	0.020	0.010	0.000
B subtotal	1.000	1.000	1.000	1.000	1.000	1.000	1.010	0.990	1.020	1.010
sum cat.	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
O	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000

Calculated based on 3 cations and 4 oxygen atoms whereby Fe \* was split to Fe<sup>3+</sup> or Fe<sup>2+</sup> according to stoichiometry.

Representative chemical composition of amphibols								
Tool/ Sources	Tool from the Eneolithic		Lower Silesia		Western Lugi cum		Western Moravia	
Sample	4	4	7	7	8	8	10	11
SiO <sub>2</sub>	58.76	58.62	58.29	59.32	50.24	58.86	54.71	45.69
TiO <sub>2</sub>	0.00	0.03	0.00	0.00	0.78	0.00	0.07	0.75
Al <sub>2</sub> O <sub>3</sub>	0.13	0.11	0.16	0.18	6.81	0.08	3.42	13.53
Cr <sub>2</sub> O <sub>3</sub>	0.00	0.03	0.00	0.03	0.43	0.00	0.52	1.42
MnO	0.09	0.06	0.04	0.17	0.12	0.15	0.18	0.06
FeO	1.09	1.17	1.52	5.84	8.60	3.80	5.96	2.94
NiO	0.11	0.12	0.14	0.11	0.00	0.00	0.06	0.19
MgO	24.47	24.60	23.93	30.26	17.75	23.01	32.35	18.74
CaO	13.31	13.36	13.42	0.59	12.00	13.08	0.63	12.54
Na <sub>2</sub> O	0.07	0.18	0.05	0.05	1.81	0.29	0.06	2.35
K <sub>2</sub> O	0.05	0.07	0.00	0.00	0.07	0.05	0.00	0.04
ZnO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl <sup>-</sup>	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00
F <sup>-</sup>	0.05	0.00	0.00	0.00	0.07	0.06	0.00	0.14
H <sub>2</sub> O *	2.19	2.21	2.20	2.21	2.04	2.19	2.22	2.08
O <sup>2-</sup> =Cl <sup>-</sup>	0.00	0.00	0.00	0.00	-0.04	0.00	0.00	0.00
O <sup>2-</sup> =F <sup>-</sup>	-0.02	0.00	0.00	0.00	-0.03	-0.03	0.00	-0.06
Total	100.30	100.56	99.75	98.76	100.83	101.54	100.18	100.41
apfu								
Si	7.966	7.938	7.962	8.030	7.106	7.973	7.387	6.390
Ti	0.000	0.003	0.000	0.000	0.083	0.000	0.007	0.079
Al	0.021	0.018	0.026	0.029	1.135	0.013	0.544	2.230
Cr	0.000	0.003	0.000	0.003	0.048	0.000	0.056	0.157
Mn	0.010	0.007	0.005	0.019	0.014	0.017	0.021	0.007
Fe <sup>2+</sup>	0.124	0.132	0.174	0.661	1.017	0.430	0.673	0.344
Ni	0.012	0.013	0.015	0.012	0.000	0.000	0.007	0.021
Mg	4.945	4.966	4.873	6.107	3.743	4.647	6.512	3.907
Ca	1.933	1.938	1.964	0.086	1.819	1.898	0.091	1.879
Na	0.018	0.047	0.013	0.013	0.496	0.076	0.016	0.637
K	0.009	0.012	0.000	0.000	0.013	0.009	0.000	0.007
Zn	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cl <sup>-</sup>	0.000	0.000	0.000	0.000	0.043	0.000	0.000	0.000
F <sup>-</sup>	0.021	0.000	0.000	0.000	0.031	0.026	0.000	0.062
H <sup>+</sup>	1.979	2.000	2.000	2.000	1.926	1.974	2.000	1.938
O <sup>2-</sup>	23.979	24.000	24.000	24.000	23.926	23.974	24.000	23.938
Sum cat.	15.038	15.078	15.032	14.960	15.474	15.063	15.313	15.659
O	24.000	24.000	24.000	24.000	24.000	24.000	24.000	24.000

Calculated based on 24 oxygen atoms, where (O<sup>2-</sup> + OH<sup>-</sup> + F<sup>-</sup>) = 2, assuming that all Fe is divalent.

\* calculated according to stoichiometry