

Supplementary Information

XRD Interpretation of Natural Ende Zeolite

Pemanfaatan Zeolit Alam Ende Sebagai Katalis dalam Pirolisis Polietilena dari Sampah Plastik

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Interpretasi Zeoli Alam Sebelum Aktivasi

peak	D (Å)	D (Å)	Crystals Name	Composition	Ratio (%)
1	6.46990	6.4738	Laumontite	$\text{Ca}(\text{Al}_8\text{Si}_{16}\text{O}_{48}) \cdot 16\text{H}_2\text{O}$	2.253521
2	5.95495	5.9686	Heulandite	$\text{Ca}_4(\text{Al}_8\text{Si}_{28}\text{O}_{72}) \cdot 24\text{H}_2\text{O}$	1.126761
3	5.73788	5.7461	Erionite	$\text{NaCa}_5\text{K}(\text{Al}_9\text{Si}_{27}\text{O}_{72}) \cdot 27\text{H}_2\text{O}$	1.408451
4	4.98504	4.9767	Erionite	$\text{NaCa}_5\text{K}(\text{Al}_9\text{Si}_{27}\text{O}_{72}) \cdot 27\text{H}_2\text{O}$	1.126761
5	4.88508	4.8767	Mordenite	$\text{Na}_8(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	1.126761
6	4.82120	4.8194	Laumontite	$\text{Ca}(\text{Al}_8\text{Si}_{16}\text{O}_{48}) \cdot 16\text{H}_2\text{O}$	0.845070
7	4.47266	4.7420	Scolecite	$\text{Ca}_4(\text{Si}_{24}\text{Al}_8\text{O}_{40}) \cdot 12\text{H}_2\text{O}$	3.380282
8	4.40925	4.4011	Scolecite	$\text{Ca}_4(\text{Si}_{24}\text{Al}_8\text{O}_{40}) \cdot 12\text{H}_2\text{O}$	0.845070
9	4.21882	4.2196	Scolecite	$\text{Ca}_4(\text{Si}_{24}\text{Al}_8\text{O}_{40}) \cdot 12\text{H}_2\text{O}$	5.352113
10	4.09964	4.1064	Natrolite	$\text{Na}_4(\text{Al}_4\text{Si}_6\text{O}_{20}) \cdot 4\text{H}_2\text{O}$	1.126761
11	3.95986	3.9550	Clinoptilolite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	3.098592
12	3.83498	3.8316	Clinoptilolite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	0.845070
13	3.79947	3.7800	Laumontite	$\text{Ca}(\text{Al}_8\text{Si}_{16}\text{O}_{48}) \cdot 16\text{H}_2\text{O}$	2.253521
14	3.75526	3.7640	Mordenite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	1.126761
15	3.73047	3.7364	Clinoptilolite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	1.690141
16	3.44189	3.4212	Clinoptilolite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	6.197183
17	3.37475	3.3899	Clinoptilolite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	2.535211
18	3.34434	3.3446	Alpha Quartz	Si_3O_6	28.169010
19	3.28212	3.2921	Mordenite	$\text{Na}_8(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	1.690141
20	3.24005	3.2447	Mordenite	$\text{Na}_8(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	1.126761
21	3.20357	3.2234	Mordenite	$\text{Na}_8(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	4.507042
22	3.18341	3.1703	Clinoptilolite	$\text{Na}_4\text{K}_4(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	3.380282
23	2.87638	2.8986	Natrolite	$\text{Na}_4(\text{Al}_4\text{Si}_6\text{O}_{20}) \cdot 4\text{H}_2\text{O}$	1.408451
24	2.50645	2.5211	Mordenite	$\text{Na}_8(\text{Al}_8\text{Si}_{40}\text{O}_{96}) \cdot 24\text{H}_2\text{O}$	1.408451
25	2.44660	2.4580	Alpha Quartz	Si_3O_6	1.971831

26	2.27394	2.2793	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	2.253521
27	2.23183	2.2375	Alpha Quartz	Si ₃ O ₆	0.845070
28	2.12152	2.1287	Alpha Quartz	Si ₃ O ₆	1.408451
29	1.97194	1.9806	Alpha Quartz	Si ₃ O ₆	1.408451
30	1.81398	1.8184	Alpha Quartz	Si ₃ O ₆	3.661972
31	1.78858	1.8018	Alpha Quartz	Si ₃ O ₆	1.126761
32	1.66752	1.6723	Alpha Quartz	Si ₃ O ₆	1.126761
33	1.53939	1.5423	Alpha Quartz	Si ₃ O ₆	2.253521
34	1.46074	1.4532	Alpha Quartz	Si ₃ O ₆	1.408451
35	1.38178	1.3826	Alpha Quartz	Si ₃ O ₆	1.408451
36	1.37350	1.3753	Alpha Quartz	Si ₃ O ₆	2.535211
37	1.36795	1.3726	Alpha Quartz	Si ₃ O ₆	0.845070
38	1.19912	1.1808	Alpha Quartz	Si ₃ O ₆	1.126761

Interpretasi Zeolit Alam Sesudah Aktivasi

peak	d (Å)	d (Å)	Crystals Name	Composition	Ratio (%)
1	6.47650	6.4738	Laumontite	Ca(Al ₈ Si ₁₆ O ₄₈). 16H ₂ O	2.272727
2	6.31025	6.2955	Erionite	NaCa ₅ K(Al ₉ Si ₂₇ O ₇₂). 27H ₂ O	1.420454
3	5.72381	5.7461	Erionite	NaCa ₅ K(Al ₉ Si ₂₇ O ₇₂). 27H ₂ O	0.852272
4	4.47206	4.4915	Laumontite	Ca(Al ₈ Si ₁₆ O ₄₈). 16H ₂ O	2.556818
5	4.21508	4.2196	Scolecite	Ca ₄ (Si ₂₄ Al ₈ O ₄₀). 12H ₂ O	5.397727
6	3.99102	4.0044	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	2.272727
7	3.96644	3.9550	Clinoptilolite	Na ₄ (Al ₄ Si ₆ O ₂₀). 4H ₂ O	3.125000
8	3.73057	3.7364	Clinoptilolite	Ca ₄ (Si ₂₄ Al ₈ O ₄₀). 12(H ₂ O)	1.704545
9	3.60581	3.6293	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	1.136363
10	3.35957	3.3446	Alpha Quartz	Si ₃ O ₆	6.534090
11	3.39240	3.3951	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	0.852272
12	3.36724	3.3899	Clinoptilolite	Na ₄ (Al ₄ Si ₆ O ₂₀). 4H ₂ O	3.693181
13	3.24444	3.2447	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	28.409090
14	3.26329	3.2447	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	1.136363
15	3.23084	3.2234	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	1.420454
16	3.19682	3.1703	Clinoptilolite	Na ₄ (Al ₄ Si ₆ O ₂₀). 4H ₂ O	4.829545
17	3.18119	3.1703	Clinoptilolite	Na ₄ (Al ₄ Si ₆ O ₂₀). 4H ₂ O	4.545454
18	2.92757	2.9456	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	2.272727
19	2.87829	2.8986	Natrolite	Na ₄ (Al ₄ Si ₆ O ₂₀). 4H ₂ O	1.988636
20	2.55764	2.5662	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	1.136363
21	2.50712	2.5211	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	1.136363
22	2.44643	2.4580	Alpha Quartz	Si ₃ O ₆	2.272727
23	2.27194	2.2793	Mordenite	Na ₈ (Al ₈ Si ₄₀ O ₉₆). 24H ₂ O	1.988636
24	2.22766	2.2375	Alpha Quartz	Si ₃ O ₆	0.852272
25	2.13339	2.1287	Alpha Quartz	Si ₃ O ₆	0.852272
26	2.11996	2.1287	Alpha Quartz	Si ₃ O ₆	1.420454
27	1.97329	1.9806	Alpha Quartz	Si ₃ O ₆	1.136363
28	1.81256	1.8184	Alpha Quartz	Si ₃ O ₆	3.409090
29	1.80754	1.8018	Alpha Quartz	Si ₃ O ₆	1.420454

30	1.60238	1.6091	Alpha Quartz	Si ₃ O ₆	1.136363
31	1.56480	1.5423	Alpha Quartz	Si ₃ O ₆	1.136363
32	1.53878	1.4532	Alpha Quartz	Si ₃ O ₆	2.556818
33	1.38008	1.3826	Alpha Quartz	Si ₃ O ₆	1.420454
34	1.37204	1.3726	Alpha Quartz	Si ₃ O ₆	1.704545