Effect of SiO_2, ZrO_2, and SiO_2-ZrO_2 Supports on Product Distribution in Glucose Hydrogenolysis over Cu-Ni-WO_x Catalysts

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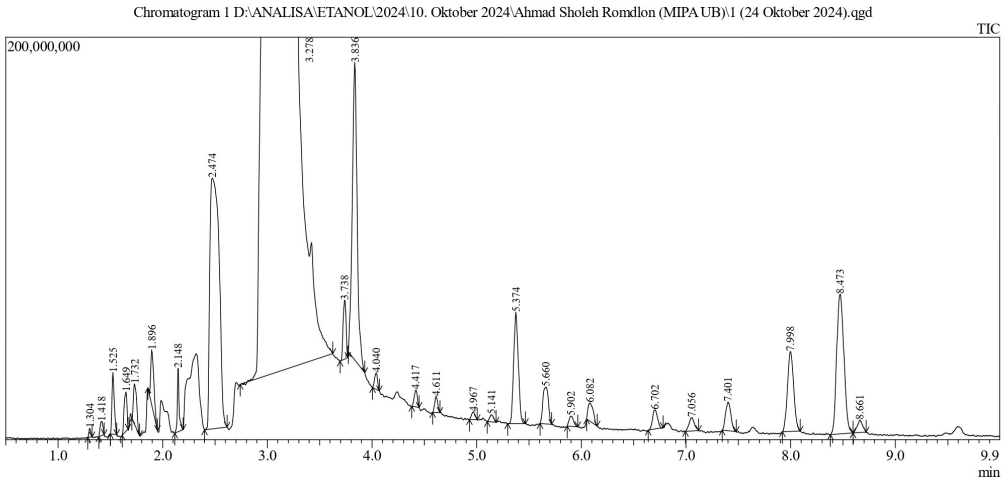
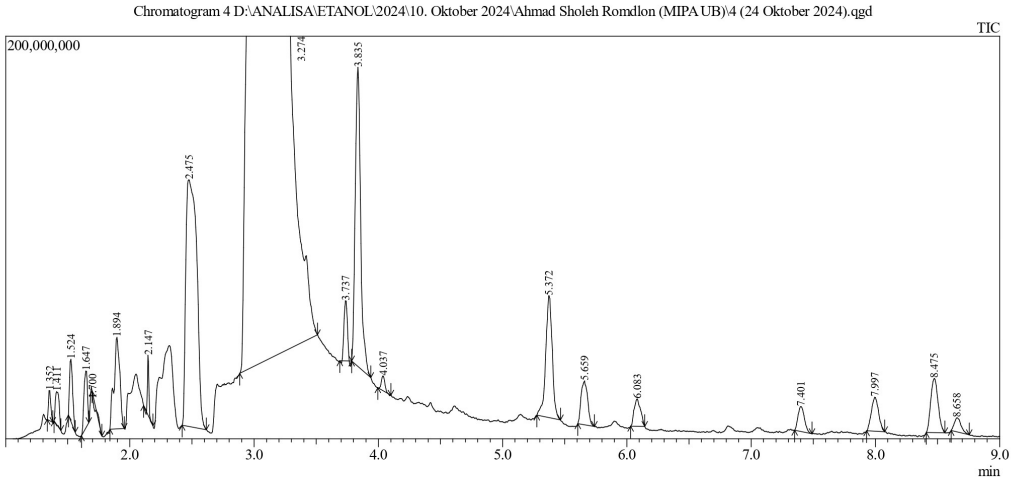


Peak Report TIC

Peak#	R.Time	Area	Area%	Height	Height%	Base m/z	Name
1	1.304	4701468	0.05	4134632	0.43	40.00	l-Alanine ethylamide, (S)-
2	1.418	12585012	0.15	6623555	0.70	44.00	Acetaldehyde
3	1.525	45806219	0.53	28979762	3.05	43.15	Ethene, methoxy-
4	1.649	37125192	0.43	18530375	1.95	44.00	Butanal
5	1.732	39970472	0.47	19140607	2.01	45.05	Ethanol
6	1.896	52080747	0.61	25898828	2.72	43.90	DL-Alanine, N-acetyl-
7	2.148	37233872	0.43	29890414	3.14	57.00	Undecane
8	2.474	731062068	8.51	118392153	12.45	74.05	.+/-.-Tetrahydro-3-furanmethanol
9	3.278	6206181828	72.21	278738034	29.32	76.10	Succinimide, thio-
10	3.738	53165903	0.62	27863776	2.93	72.15	Hexanal, 2-ethyl-
11	3.836	448965330	5.22	140408482	14.77	70.90	Succinimide, thio-
12	4.040	14815775	0.17	7773983	0.82	57.00	2-Buten-1-ol
13	4.417	15808462	0.18	7846012	0.83	42.05	1,3-Dioxane, 4,5-dimethyl-
14	4.611	15372778	0.18	7664857	0.81	42.00	1-Pentanol
15	4.967	8696547	0.10	3625948	0.38	42.00	1,3-Dioxane, 4,5-dimethyl-
16	5.141	8515551	0.10	3372724	0.35	43.00	3(2H)-Furanone, dihydro-2-methyl-
17	5.374	162270602	1.89	52511569	5.52	55.05	(2S,3S)-(-)-3-Propyloxiranemethanol
18	5.660	62999564	0.73	17428867	1.83	45.15	2-Propanone, 1-methoxy-
19	5.902	14059747	0.16	4784996	0.50	42.00	2-(Oxolan-3-yl)ethanol
20	6.082	29705830	0.35	8563478	0.90	43.05	Acetic acid, methyl ester
21	6.702	29529814	0.34	9034604	0.95	85.00	2H-Pyran-2-methanol, tetrahydro-
22	7.056	22837776	0.27	6298552	0.66	81.00	2-Cyclopenten-1-one, 3-methyl-
23	7.401	47471941	0.55	13506288	1.42	59.00	Oxirane, tetramethyl-
24	7.998	154985576	1.80	37709144	3.97	45.00	2-Pentanol, 5-(2-propynyloxy)-
25	8.473	318011891	3.70	66008223	6.94	96.15	2-Cyclopenten-1-one, 3-methyl-
26	8.661	21069808	0.25	5973830	0.63	57.00	1-Hydroxy-2-butanone
		8595029773	100.00	950703693	100.00		

Figure S1. GC-MS TIC (Total Ion Chromatogram) of the product analysis results from the hydrogenolysis reaction of glucose using MSZ (Cu-Ni-WO_x/SiO_2-ZrO_2) catalyst



Peak Report TIC

Peak#	R.Time	Area	Area%	Height	Height%	Base m/z	Name
1	1.352	18155710	0.23	14211578	1.62	41.05	n-Hexane
2	1.411	34002815	0.42	15739148	1.79	44.05	Acetaldehyde
3	1.524	49783905	0.62	29505768	3.36	43.90	Formic acid, ethenyl ester
4	1.647	54425615	0.68	27021453	3.07	44.00	Butanal
5	1.700	-6472509	-0.08	-2482568	-0.28	43.05	Ethanol
6	1.894	143953458	1.80	43716477	4.97	86.05	Acetamide, N,N-bis(1-methylethyl)-
7	2.147	21568124	0.27	28660128	3.26	57.00	Tridecane, 6-methyl-
8	2.475	718128521	8.96	117693236	13.39	74.05	.+/-.-Tetrahydro-3-furanmethanol
9	3.274	5918051863	73.85	274010017	31.17	76.05	Succinimide, thio-
10	3.737	51371033	0.64	28607928	3.25	72.05	Hexanal, 2-ethyl-
11	3.835	426120443	5.32	142667876	16.23	57.90	Succinimide, thio-
12	4.037	12773976	0.16	6999668	0.80	57.00	2-Buten-1-ol
13	5.372	210857015	2.63	58012207	6.60	73.15	4-Penten-1-ol, 2,2,4-trimethyl-
14	5.659	76601464	0.96	21047746	2.39	45.05	2-Propanone, 1-methoxy-
15	6.083	46917027	0.59	13022608	1.48	43.05	Pyrimidine-2,4(1H,3H)-dione, 5-amino-6-nitr
16	7.401	42153700	0.53	11915450	1.36	59.00	Oxirane, tetramethyl-
17	7.997	64873925	0.81	16190049	1.84	45.00	E-1-Methoxy-3-hexene
18	8.475	104900747	1.31	25849493	2.94	67.00	2-Cyclopenten-1-one, 2-methyl-
19	8.658	25332225	0.32	6670500	0.76	57.00	1-Hydroxy-2-butanone
		8013499057	100.00	879058762	100.00		

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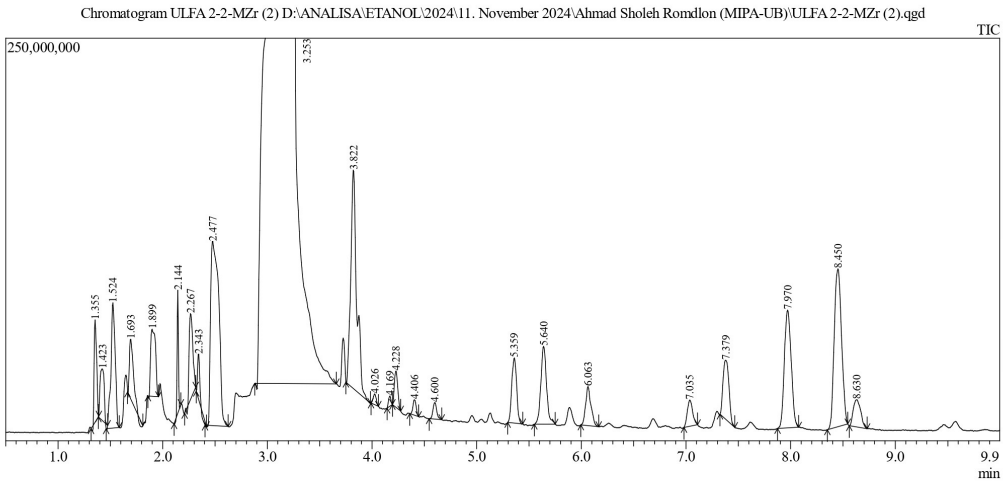
Figure S2. GC-MS TIC (Total Ion Chromatogram) of the product analysis results from the hydrogenolysis reaction of glucose using MS (Cu-Ni-WO_x/SiO_2) catalyst



Peak Report TIC

Peak#	R.Time	Area	Area%	Height	Height%	Base m/z	Name
1	1.355	100707342	1.08	63351811	4.72	57.15	Pentane, 2,3-dimethyl-
2	1.423	81905170	0.87	32003569	2.38	42.00	2-Isopropoxyethylamine
3	1.524	220600171	2.36	77740646	5.79	59.00	Oxirane, (ethoxymethyl)-
4	1.693	91045633	0.97	36666160	2.73	57.05	Guanidine, N-methyl-N'-nitro-N-nitroso-
5	1.899	135730590	1.45	41559895	3.10	42.05	2-Oxetanone, 4-methyl-
6	2.144	68423815	0.73	76501903	5.70	57.15	Nonane, 5-butyl-
7	2.267	132557485	1.42	53152943	3.96	100.15	3-Buten-1-amine, n-butyl-N-methyl-
8	2.343	30070832	0.32	28028713	2.09	100.05	2-Propanone, dimethylhydrazone
9	2.477	615508001	6.57	114412253	8.53	74.15	.+/-.-Tetrahydro-3-furanmethanol
10	3.253	5744477604	61.34	273449313	20.38	76.05	Succinimide, thio-
11	3.822	537255218	5.74	135708880	10.11	69.95	Oxetane, 2-(1,1-dimethylethyl)-3-methyl-
12	4.026	13016168	0.14	6672185	0.50	57.05	2-Buten-1-ol
13	4.169	10222820	0.11	6547291	0.49	83.10	3-Hexen-2-one
14	4.228	49344702	0.53	22500111	1.68	69.05	Cyclopentanone, 3-methyl-
15	4.406	19497066	0.21	9646891	0.72	42.05	1,3-Dioxane, 4,5-dimethyl-
16	4.600	25162860	0.27	10287496	0.77	42.05	1-Pentanol
17	5.359	130616664	1.39	40535128	3.02	73.15	1-Hepten-4-ol
18	5.640	181751290	1.94	48337198	3.60	45.95	Tetramethylhydrazine
19	6.063	86729875	0.93	24095595	1.80	43.05	2(3H)-Furanone, dihydro-4-hydroxy-
20	7.035	57276473	0.61	16265740	1.21	81.05	2-Cyclopenten-1-one, 3-methyl-
21	7.379	142094064	1.52	36644790	2.73	59.15	(2,3,3-Trimethyloxiranyl)methanol
22	7.970	331405082	3.54	73072912	5.44	57.00	Cyclobutanemethanol, .alpha.-methyl-
23	8.450	476475076	5.09	97996710	7.30	68.00	1,4-Butanediol, 2,3-bis(methylene)-
24	8.630	82445769	0.88	16850067	1.26	57.15	1-Hydroxy-2-butanone
		9364319770	100.00	1342028200	100.00		

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Figure S3. GC-MS TIC (Total Ion Chromatogram) of the product analysis results from the hydrogenolysis reaction of glucose using MZ (Cu-Ni-WO_x/ZrO_2) catalyst