

Tabel 1. Daftar potensial standar.

Reaction	Potential, volts	Reaction	Potential, volts
$\text{ClO}_2^- + \text{H}_2\text{O} + 2e^- \rightarrow \text{ClO}_2 + 2\text{OH}^-$	0.17	$\text{PtCl}_4^{2-} + 2e^- \rightarrow \text{Pt} + 4\text{Cl}^-$	0.73
$\text{Ag}_2\text{Fe}(\text{CN})_6 + 4e^- \rightarrow 4\text{Ag} + \text{Fe}(\text{CN})_6^{4-}$	0.1943	$\text{TeO}_4^{2-} + 4\text{H}^+ + 3e^- \rightarrow \text{TeO}_3(\text{aq}) + 2\text{H}_2\text{O}$	0.738
$\text{SO}_4^{2-} + 4\text{H}^+ + 2e^- \rightarrow \text{H}_2\text{SO}_3 + \text{H}_2\text{O}$	0.20	$\text{Np}^{3+} + e^- \rightarrow \text{Np}^{2+}(\text{if HClO}_4)$	0.739
$\text{Co}(\text{OH})_2 + e^- \rightarrow \text{Co}(\text{OH}) + \text{OH}^-$	0.2	$\text{Ag}_2\text{O}_3 + \text{H}_2\text{O} + 2e^- \rightarrow 2\text{AgO} + 2\text{OH}^-$	0.74
$\text{SbO}^+ + 2\text{H}^+ + 3e^- \rightarrow \text{Sb} + 2\text{H}_2\text{O}$	(0.17)	$\text{H}_2\text{SeO}_3 + 4\text{H}^+ + 4e^- \rightarrow \text{Se} + 3\text{H}_2\text{O}$	0.74
$\text{AgCl} + e^- \rightarrow \text{Ag} + \text{Cl}^-$	0.2223	$\text{PtCl}_6^{2-} + 2e^- \rightarrow \text{PtCl}_4^{2-} + 2\text{Cl}^-$	0.747
*Calomel Electrode, Sat'd NaCl	0.2360	$\text{Fe}^{3+} + e^- \rightarrow \text{Fe}^{2+}(\text{if HClO}_4)$	0.75
$\text{As}_2\text{O}_3 + 6\text{H}^+ + 6e^- \rightarrow 2\text{As} + 3\text{H}_2\text{O}$	0.234	$\text{Sb}^{3+} + 2e^- \rightarrow \text{Sb}^{2+}(3.5\text{f HCl})$	0.76
*Calomel Electrode, Sat'd KCl	0.2415	$\text{ClO}_2^- + 2\text{H}_2\text{O} + 4e^- \rightarrow \text{Cl}^- + 4\text{OH}^-$	0.76
$\text{HAsO}_2 + 3\text{H}^+ + 3e^- \rightarrow \text{As} + 2\text{H}_2\text{O}$	0.2475	$\text{NiO}_2 + 2\text{H}_2\text{O} + 2e^- \rightarrow \text{Ni}(\text{OH})_2 + 2\text{OH}^-$	0.76
$\text{IO}_3^- + 3\text{H}_2\text{O} + 6e^- \rightarrow \text{I}^- + 6\text{OH}^-$	0.26	$2\text{NO} + \text{H}_2\text{O} + 2e^- \rightarrow \text{N}_2\text{O} + 2\text{OH}^-$	0.768
$\text{ReO}_2 + 4\text{H}^+ + 4e^- \rightarrow \text{Re} + 2\text{H}_2\text{O}$	0.26	$\text{ReO}_4^- + 2\text{H}^+ + e^- \rightarrow \text{ReO}_3(\text{aq}) + 2\text{H}_2\text{O}$	0.77
$\text{Hg}_2\text{Cl}_2 + 2e^- \rightarrow 2\text{Hg} + 2\text{Cl}^-$	0.2682	$(\text{CNS})_2 + 2e^- \rightarrow 2\text{CNS}^-$	0.770
Calomel Electrode, Molal KCl	0.2800	$\text{Fe}^{3+} + e^- \rightarrow \text{Fe}^{2+}$	0.770
$\text{PbO}_2 + \text{H}_2\text{O} + 2e^- \rightarrow \text{PbO} + 2\text{OH}^-$	0.28	$\text{Fe}^{3+} + e^- \rightarrow \text{Fe}^{2+}(\text{if HCl})$	0.77
*Calomel Electrode, N KCl	0.2807	$\text{IrCl}_6^{3-} + 3e^- \rightarrow \text{Ir} + 6\text{Cl}^-$	0.783
$\text{Re}^{3+} + 3e^- \rightarrow \text{Re}$	0.3	$\text{Ti}^{3+} + 2e^- \rightarrow \text{Ti}^{2+}(\text{if HCl})$	0.7961
$\text{BiO}^+ + 2\text{H}^+ + 3e^- \rightarrow \text{Bi} + \text{H}_2\text{O}$	0.32	$\text{Hg}_2^{2+} + 2e^- \rightarrow 2\text{Hg}$	0.7986
$2\text{HCNO} + 2\text{H}^+ + 2e^- \rightarrow (\text{CN})_2 + 2\text{H}_2\text{O}$	0.33	$1/2\text{Hg}_2^{2+} + e^- \rightarrow \text{Hg}$	0.7996
*Calomel Electrode 0.1 N KCl	0.3337	$\text{Ag}^+ + e^- \rightarrow \text{Ag}$	0.80
$\text{UO}_2^{2+} + 4\text{H}^+ + 2e^- \rightarrow \text{U}^{4+} + 2\text{H}_2\text{O}$	0.334	$2\text{HNO}_2 + 4\text{H}^+ + 4e^- \rightarrow \text{H}_2\text{N}_2\text{O}_2 + 2\text{H}_2\text{O}$	0.81
$\text{VO}^{2+} + 2\text{H}^+ + e^- \rightarrow \text{V}^{3+} + \text{H}_2\text{O}$	0.337	$2\text{NO}_2 + 4\text{H}^+ + 2e^- \rightarrow \text{N}_2\text{O}_4 + 2\text{H}_2\text{O}$	0.815
$\text{Cu}^{2+} + 2e^- \rightarrow \text{Cu}$	0.3402	$1/2\text{O}_2 + 2\text{H}^+(10^{-7}\text{M}) + 2e^- \rightarrow \text{H}_2\text{O}$	0.83
$\text{Hg}_2\text{Cl}_2 + 2e^- \rightarrow 2\text{Hg} + 2\text{Cl}^-(0.1\text{N NaOH})$	0.3419	$\text{Pd}^{2+} + 2e^- \rightarrow \text{Pd}$	0.85
$\text{Ag}_2\text{O} + \text{H}_2\text{O} + 2e^- \rightarrow 2\text{Ag} + 2\text{OH}^-$	(0.268)	$\text{OsO}_4 + 8\text{H}^+ + 8e^- \rightarrow \text{Os} + 4\text{H}_2\text{O}$	0.851
$\text{Nb}^{5+} + 2e^- \rightarrow \text{Nb}^{3+}(2\text{f HCl})$	0.342	$\text{Hg}^{2+} + 2e^- \rightarrow \text{Hg}$	0.858
$\text{Cu}^{2+} + 2e^- \rightarrow \text{Cu}(\text{Hg})$	0.344	$\text{AuBr}_2^- + 3e^- \rightarrow \text{Au} + 4\text{Br}^-$	0.858
$\text{ClO}_2^- + \text{H}_2\text{O} + 2e^- \rightarrow \text{ClO}_2 + 2\text{OH}^-$	0.345	$\text{Ru}^{3+} + e^- \rightarrow \text{Ru}^{2+}(2\text{f HCl})$	0.86
$\text{AgI}_2 + e^- \rightarrow \text{Ag} + \text{I}_2$	0.35	$\text{TiO}_2 + 4\text{H}^+ + 4e^- \rightarrow \text{Ti} + 2\text{H}_2\text{O}$	0.87
$\text{Ag}_2\text{SeO}_3 + 2e^- \rightarrow 2\text{Ag} + \text{SeO}_3^{2-}$	0.3551	$\text{HO}_2 + \text{H}_2\text{O} + 2e^- \rightarrow 3\text{OH}^-$	0.88
$\text{ReO}_4^- + 8\text{H}^+ + 7e^- \rightarrow \text{Re} + 4\text{H}_2\text{O}$	0.3629	$\text{N}_2\text{O}_4 + 2e^- \rightarrow 2\text{NO}_2$	0.90
$(\text{CN})_2 + 2\text{H}^+ + 2e^- \rightarrow 2\text{HCN}$	0.367	$\text{ClO}^- + \text{H}_2\text{O} + 2e^- \rightarrow \text{Cl}^- + 2\text{OH}^-$	0.905
$\text{O}_2 + 2\text{H}_2\text{O} + 4e^- \rightarrow 4\text{OH}^-$	0.401	$2\text{Hg}^{2+} + 2e^- \rightarrow \text{Hg}_2^{2+}$	0.9184
$\text{AgOCN} + e^- \rightarrow \text{Ag} + \text{OCN}^-$	0.41	$\text{Pu}^{3+} + e^- \rightarrow \text{Pu}^{2+}(\text{if HClO}_4)$	0.94
$\text{Fe}^{3+} + e^- \rightarrow \text{Fe}^{2+}(\text{if H}_3\text{PO}_4)$	0.438	$\text{NO}_2 + 3\text{H}^+ + 2e^- \rightarrow \text{HNO}_2 + \text{H}_2\text{O}$	0.954
$\text{Rh}(\text{Cl})_3 + 3e^- \rightarrow \text{Rh} + 6\text{Cl}^-$	0.44	$\text{ClO}_2(\text{aq}) + e^- \rightarrow \text{ClO}_2^-$	0.96
$\text{Ag}_2\text{CrO}_4 + 2e^- \rightarrow 2\text{Ag} + \text{CrO}_4^{2-}$	0.4463	$\text{NO}_2 + 4\text{H}^+ + 3e^- \rightarrow \text{NO} + 2\text{H}_2\text{O}$	0.963
$\text{H}_2\text{SO}_3 + 4\text{H}^+ + 4e^- \rightarrow \text{S} + 3\text{H}_2\text{O}$	0.45	$\text{AuBr}_2^- + e^- \rightarrow \text{Au} + 2\text{Br}^-$	0.982
$\text{Fe}(\text{CN})_6^{3-} + e^- \rightarrow \text{Fe}(\text{CN})_6^{4-}(0.01\text{f NaOH})$	0.46	$\text{Pu}^{4+} + e^- \rightarrow \text{Pu}^{3+}(\text{if HClO}_4)$	0.987
$\text{Ag}_2(\text{WO}_4) + 2e^- \rightarrow 2\text{Ag} + \text{WO}_4^{2-}$	0.466	$\text{Pd}^{2+} + 2e^- \rightarrow \text{Pd}(4\text{f HClO}_4)$	0.99
$\text{TeO}_4^{2-} + 8\text{H}^+ + 7e^- \rightarrow \text{Te} + 4\text{H}_2\text{O}$	0.472	$\text{HIO} + \text{H}^+ + 2e^- \rightarrow \text{I}^- + \text{H}_2\text{O}$	0.99
$\text{Ag}_2\text{CO}_3 + 2e^- \rightarrow 2\text{Ag} + \text{CO}_3^{2-}$	0.4769	$\text{HNO}_2 + \text{H}^+ + e^- \rightarrow \text{NO} + \text{H}_2\text{O}$	0.994
$\text{Ag}_2\text{C}_2\text{O}_4 + 2e^- \rightarrow 2\text{Ag} + \text{C}_2\text{O}_4^{2-}$	0.4776	$\text{AuCl}_4^- + 3e^- \rightarrow \text{Au} + 4\text{Cl}^-$	1.00
$\text{Ag}_2\text{MoO}_4 + 2e^- \rightarrow 2\text{Ag} + \text{MoO}_4^{2-}$	0.49	$\text{RuO}_4^{2-} + e^- \rightarrow \text{RuO}_4^-$	1.00
$\text{IO}^- + \text{H}_2\text{O} + 2e^- \rightarrow \text{I}^- + 2\text{OH}^-$	0.49	$\text{VO}_2^+ + 2\text{H}^+ + e^- \rightarrow \text{VO}^{2+} + \text{H}_2\text{O}$	1.00
$\text{NiO}_2 + 2\text{H}_2\text{O} + 2e^- \rightarrow \text{Ni}(\text{OH})_2 + 2\text{OH}^-$	0.49	$\text{V}(\text{OH})_3 + 2\text{H}^+ + e^- \rightarrow \text{VO}^{2+} + 3\text{H}_2\text{O}$	1.02
$\text{Ru}^{3+} + e^- \rightarrow \text{Ru}^{2+}(0.1\text{f HClO}_4)$	0.49	$\text{H}_2\text{TeO}_4(\text{aq}) + 2\text{H}^+ + 2e^- \rightarrow \text{TeO}_3(\text{aq}) + 4\text{H}_2\text{O}$	1.02
$\text{ReO}_4^- + 4\text{H}^+ + 3e^- \rightarrow \text{ReO}_2 + 2\text{H}_2\text{O}$	0.51	$\text{IrCl}_6^{3-} + 3e^- \rightarrow \text{Ir} + 6\text{Cl}^-$	1.02
$\text{Hg}(\text{AcO})_2 + 2e^- \rightarrow 2\text{Hg} + 2\text{AcO}^-$	0.5113	$\text{U}^{3+} + e^- \rightarrow \text{U}^{2+}(\text{if HCl})$	1.03
$\text{Cu}^+ + e^- \rightarrow \text{Cu}$	0.522	$\text{N}_2\text{O}_4 + 4\text{H}^+ + 4e^- \rightarrow 2\text{NO} + 2\text{H}_2\text{O}$	1.052
$\text{I}_2 + 2e^- \rightarrow 2\text{I}^-$	0.5338	$\text{Pu}^{3+} + 2e^- \rightarrow \text{Pu}^{2+}(\text{if HCl})$	1.056
$\text{IO}_3^- + 2\text{H}_2\text{O} + 4e^- \rightarrow \text{I}^- + 4\text{OH}^-$	0.535	$\text{Fe}(\text{phenanthroline})_3^{3+} + e^- \rightarrow \text{Fe}(\text{ph})_3^{2+}(2\text{f H}_2\text{SO}_4)$	1.065
$\text{MnO}_4^- + e^- \rightarrow \text{MnO}_4^{2-}$	0.56	$\text{Br}_{2(\text{aq})} + 2e^- \rightarrow 2\text{Br}^-$	1.07
$\text{MnO}_4^- + 2\text{H}_2\text{O} + 3e^- \rightarrow \text{MnO}_2 + 4\text{OH}^-$	0.58	$\text{N}_2\text{O}_4 + 2\text{H}^+ + 2e^- \rightarrow 2\text{HNO}_2$	1.085
$\text{H}_2\text{AsO}_4 + 2\text{H}^+ + 2e^- \rightarrow \text{HAsO}_2 + 2\text{H}_2\text{O}(\text{if HCl})$	0.588	$\text{IO}_2^- + 6\text{H}^+ + 6e^- \rightarrow \text{I}^- + 3\text{H}_2\text{O}$	1.087
$\text{MnO}_2 + 2\text{H}_2\text{O} + 3e^- \rightarrow \text{MnO} + 4\text{OH}^-$	0.59	$\text{Br}_{2(\text{aq})} + 2e^- \rightarrow 2\text{Br}^-$	1.099
$\text{AgNO}_2 + e^- \rightarrow \text{Ag} + \text{NO}_2^-$	0.59	$\text{Pu}^{3+} + e^- \rightarrow \text{Pu}^{2+}(0.5\text{f HCl})$	1.10
$\text{ClO}_2^- + \text{H}_2\text{O} + 2e^- \rightarrow \text{ClO}_2 + 2\text{OH}^-$	0.593	$\text{Cr}^{6+} + 3e^- \rightarrow \text{Cr}^{3+}(2\text{f H}_2\text{SO}_4)$	1.12
$\text{TeO}_3 + 4\text{H}^+ + 4e^- \rightarrow \text{Te} + 2\text{H}_2\text{O}$	0.599	$\text{Cu}^{2+} + 2\text{CN}^- + e^- \rightarrow \text{Cu}(\text{CN})_2$	1.137
$2\text{AgO} + \text{H}_2\text{O} + 2e^- \rightarrow \text{Ag}_2\text{O} + 2\text{OH}^-$	0.6	$\text{Np}^{3+} + e^- \rightarrow \text{Np}^{2+}(\text{if HClO}_4)$	1.14
$\text{S}_2\text{O}_8^{2-} + 4\text{H}^+ + 2e^- \rightarrow 2\text{H}_2\text{SO}_4$	0.61	$\text{Fe}(\text{phenanthroline})_3^{3+} + e^- \rightarrow \text{Fe}(\text{ph})_3^{2+}$	1.15
$\text{BrO}_3^- + 3\text{H}_2\text{O} + 6e^- \rightarrow \text{Br}^- + 6\text{OH}^-$	0.6158	$\text{SeO}_4^{2-} + 4\text{H}^+ + 2e^- \rightarrow \text{H}_2\text{SeO}_3 + \text{H}_2\text{O}$	1.15
$\text{Hg}_2\text{SO}_4 + 2e^- \rightarrow 2\text{Hg} + \text{SO}_4^{2-}$	0.62	$\text{ClO}_2 + e^- \rightarrow \text{ClO}_2^-$	1.15
$\text{ClO}_2^- + 3\text{H}_2\text{O} + 6e^- \rightarrow \text{Cl}^- + 6\text{OH}^-$	0.62	$\text{ClO}_2^- + 2\text{H}^+ + e^- \rightarrow \text{ClO}_2 + \text{H}_2\text{O}$	1.19
$\text{UO}_2^{2+} + 4\text{H}^+ + e^- \rightarrow \text{U}^{4+} + 2\text{H}_2\text{O}$	0.623	$\text{ClO}_2^- + 2\text{H}^+ + 2e^- \rightarrow \text{ClO}_2 + \text{H}_2\text{O}$	1.19
$\text{Pd}^{2+} + 2e^- \rightarrow \text{Pd}(\text{if HCl})$	0.623	$2\text{IO}_2^- + 12\text{H}^+ + 10e^- \rightarrow \text{I}_2 + 6\text{H}_2\text{O}$	1.195
$\text{PdCl}_4^{2-} + 2e^- \rightarrow \text{Pd} + 4\text{Cl}^-$	0.63	$\text{HCrO}_4^- + 7\text{H}^+ + 3e^- \rightarrow \text{Cr}^{3+} + 4\text{H}_2\text{O}$	1.195
$\text{Te}^{4+} + 4e^- \rightarrow \text{Te}(2.5\text{f HCl})$	0.639	$\text{IO}_2^- + 6\text{H}^+ + 5e^- \rightarrow 1/2\text{I}_2 + 3\text{H}_2\text{O}$	~1.2
$\text{Hg}_2\text{HPO}_4 + \text{H}^+ + 2e^- \rightarrow 2\text{Hg} + \text{H}_2\text{PO}_4^-$	0.64	$\text{Pt}^{2+} + 2e^- \rightarrow \text{Pt}$	1.208
$\text{AgAc} + e^- \rightarrow \text{Ag} + \text{Ac}^-$	0.64	$\text{MnO}_2 + 4\text{H}^+ + 2e^- \rightarrow \text{Mn}^{2+} + 2\text{H}_2\text{O}$	1.21
$\text{Sb}_2\text{O}_3(\text{sol}) + 6\text{H}^+ + 4e^- \rightarrow 2\text{SbO}^+ + 3\text{H}_2\text{O}$	0.653	$\text{ClO}_2^- + 3\text{H}^+ + 2e^- \rightarrow \text{HClO}_2 + \text{H}_2\text{O}$	(1.23)
$\text{Ag}_2\text{SO}_4 + 2e^- \rightarrow 2\text{Ag} + \text{SO}_4^{2-}$	0.679	$\text{O}_2 + 4\text{H}^+ + 4e^- \rightarrow 2\text{H}_2\text{O}$	1.229
$\text{Fe}^{3+} + e^- \rightarrow \text{Fe}^{2+}(0.5\text{f H}_2\text{SO}_4)$	0.680	$\text{O}_3 + \text{H}_2\text{O} + 2e^- \rightarrow \text{O}_2 + 2\text{OH}^-$	1.24
$\text{AgBrO}_3 + e^- \rightarrow \text{Ag} + \text{BrO}_3^-$	0.682	$\text{Ti}^{3+} + 2e^- \rightarrow \text{Ti}^{2+}$	1.247
$\text{O}_2 + 2\text{H}^+ + 2e^- \rightarrow \text{H}_2\text{O}_2$	0.69	$\text{ClO}_2 + \text{H}^+ + e^- \rightarrow \text{HClO}_2$	1.27
$\text{Fe}(\text{CN})_6^{3-} + e^- \rightarrow \text{Fe}(\text{CN})_6^{4-}(\text{if H}_2\text{SO}_4)$	0.69	$2\text{HNO}_2 + 4\text{H}^+ + 4e^- \rightarrow \text{N}_2\text{O} + 3\text{H}_2\text{O}$	(1.29)
$\text{Sb}_2\text{O}_3 + 4\text{H}^+ + 4e^- \rightarrow \text{Sb}_2\text{O}_3 + 2\text{H}_2\text{O}$	0.692	$\text{N}_2\text{H}_4^+ + 3\text{H}^+ + 2e^- \rightarrow 2\text{NH}_4^+$	~1.29
$\text{C}_6\text{H}_4\text{O}_2 + 2\text{H}^+ + 2e^- \rightarrow \text{C}_6\text{H}_4(\text{OH})_2$	0.6995	$\text{Au}^{3+} + 2e^- \rightarrow \text{Au}^{2+}$	~1.29
Quinhydrone Elec. $\text{H}^+, a = 1$	0.70	$\text{PdCl}_2 + 2e^- \rightarrow \text{PdCl} + \text{Cl}^-$	1.33
$\text{BrO}^- + \text{H}_2\text{O} + 2e^- \rightarrow \text{Br}^- + 2\text{OH}^- (\text{if NaOH})$	~0.70	$\text{HBrO} + \text{H}^+ + 2e^- \rightarrow \text{Br}^- + \text{H}_2\text{O}$	1.33
$\text{H}_2\text{IO}_6^{2-} + 2e^- \rightarrow \text{IO}_3^- + 3\text{OH}^-$	~0.70	$\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 6e^- \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O}$	1.34
		$\text{ClO}_2 + 8\text{H}^+ + 7e^- \rightarrow 1/2\text{Cl}_2 + 4\text{H}_2\text{O}$	1.3583
		$\text{Cl}_{2(\text{aq})} + 2e^- \rightarrow 2\text{Cl}^-$	1.37
		$\text{ClO}_2^- + 8\text{H}^+ + 8e^- \rightarrow \text{Cl}^- + 4\text{H}_2\text{O}$	

Reaction	Potential, volts	Reaction	Potential, volts
$\text{OH}^- + \text{e}^- \rightarrow \text{OH}^-$	1.4	$\text{HClO}_2 + 3\text{H}^+ + 3\text{e}^- \rightarrow 1/2\text{Cl}_2 + 2\text{H}_2\text{O}$	1.63
$\text{Au}^{3+} + 3\text{e}^- \rightarrow \text{Au}$	1.42	$\text{HClO} + \text{H}^+ + \text{e}^- \rightarrow 1/2\text{Cl}_2 + \text{H}_2\text{O}$	1.63
$2\text{NH}_4\text{OH} + \text{H}^+ + 2\text{e}^- \rightarrow \text{N}_2\text{H}_4 + 2\text{H}_2\text{O}$	1.42	$\text{HClO}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{HClO} + \text{H}_2\text{O}$	1.64
$\text{Rh}^{4+} + \text{e}^- \rightarrow \text{Rh}^{3+}$	1.43	$\text{MnO}_4^- + 4\text{H}^+ + 3\text{e}^- \rightarrow \text{MnO}_2 + 2\text{H}_2\text{O}$	1.679
$\text{BrO}_3^- + 6\text{H}^+ + 6\text{e}^- \rightarrow \text{Br}^- + 3\text{H}_2\text{O}$	1.44	$\text{Au}^+ + \text{e}^- \rightarrow \text{Au}$	1.68
$\text{Ce}^{4+} + \text{e}^- \rightarrow \text{Ce}^{3+}$	1.4430	$\text{PbO}_2 + \text{SO}_4^{2-} + 4\text{H}^+ + 2\text{e}^- \rightarrow \text{PbSO}_4 + 2\text{H}_2\text{O}$	1.685
$\text{Au}(\text{OH})_3 + 3\text{H}^+ + 3\text{e}^- \rightarrow \text{Au} + 3\text{H}_2\text{O}$	(1.61)	$\text{H}_2\text{IO}_4 + \text{H}^+ + 2\text{e}^- \rightarrow \text{IO}_3^- + 3\text{H}_2\text{O}$	~1.7
$\text{ClO}_3^- + 6\text{H}^+ + 6\text{e}^- \rightarrow \text{Cl}^- + 3\text{H}_2\text{O}$	1.45	$\text{Ce}(\text{OH})^{3+} + \text{H}^+ + \text{e}^- \rightarrow \text{Ce}^{3+} + \text{H}_2\text{O}$	1.7134
$\text{HIO} + \text{H}^+ + \text{e}^- \rightarrow 1/2\text{I}_2 + \text{H}_2\text{O}$	1.45	$\text{N}_2\text{O} + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{N}_2 + \text{H}_2\text{O}$	1.77
$\text{Ce}^{4+} + \text{e}^- \rightarrow \text{Ce}^{3+} (0.5\text{fH}_2\text{SO}_4)$	1.4587	$\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}_2\text{O}$	1.776
$\text{PbO}_2 + 4\text{H}^+ + 2\text{e}^- \rightarrow \text{Pb}^{2+} + 2\text{H}_2\text{O}$	1.46	$\text{Co}^{3+} + \text{e}^- \rightarrow \text{Co}^{2+} (3\text{fHNO}_3)$	1.842
$\text{ClO}_2 + 6\text{H}^+ + 5\text{e}^- \rightarrow 1/2\text{Cl}_2 + 3\text{H}_2\text{O}$	1.47	$\text{FeO}_4^{2-} + 8\text{H}^+ + 3\text{e}^- \rightarrow \text{Fe}^{3+} + 4\text{H}_2\text{O}$	1.9
$\text{HClO} + \text{H}^+ + 2\text{e}^- \rightarrow \text{Cl}^- + \text{H}_2\text{O}$	1.49	$\text{NiO}_2 + 4\text{H}^+ + 2\text{e}^- \rightarrow \text{Ni}^{2+} + 2\text{H}_2\text{O}$	1.93
$\text{MnO}_4^- + 8\text{H}^+ + 5\text{e}^- \rightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O}$	1.491	$\text{Ag}^{2+} + \text{e}^- \rightarrow \text{Ag}^+ (4\text{fHClO}_4)$	1.987
$\text{HO}_2 + \text{H}^+ + \text{e}^- \rightarrow \text{H}_2\text{O}_2$	1.5	$\text{S}_2\text{O}_8^{2-} + 2\text{e}^- \rightarrow 2\text{SO}_4^{2-}$	2.0
$\text{Mn}^{3+} + \text{e}^- \rightarrow \text{Mn}^{2+}$	1.51		(2.05)
$\text{BrO}_2 + 6\text{H}^+ + 5\text{e}^- \rightarrow 1/2\text{Br}_2 + 3\text{H}_2\text{O}$	1.52	$\text{O}_3 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{O}_2 + \text{H}_2\text{O}$	2.07
$\text{HClO}_2 + 3\text{H}^+ + 4\text{e}^- \rightarrow \text{Cl}^- + 2\text{H}_2\text{O}$	1.56	$\text{F}_2\text{O} + 2\text{H}^+ + 4\text{e}^- \rightarrow \text{H}_2\text{O} + 2\text{F}^-$	2.1
$\text{Bi}_2\text{O}_3 + 4\text{H}^+ + 2\text{e}^- \rightarrow 2\text{BiO}^+ + 2\text{H}_2\text{O}$	1.59	$\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2\text{O}$	2.42
$\text{HBrO} + \text{H}^+ + \text{e}^- \rightarrow 1/2\text{Br}_2 + \text{H}_2\text{O}$	1.59	$\text{H}_2\text{N}_2\text{O}_4 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$	2.65
$2\text{NO} + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{N}_2\text{O} + \text{H}_2\text{O}$	1.59	$1/2\text{F}_2 + \text{e}^- \rightarrow \text{F}^-$	2.85
$2\text{HBrO} + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{Br}_2 + 2\text{H}_2\text{O}$	1.6	$\text{F}_2 + 2\text{e}^- \rightarrow 2\text{F}^-$	2.87
		$1/2\text{F}_2 + \text{H}^+ + \text{e}^- \rightarrow \text{HF}$	3.03

PART 2

Reaction	Potential, volts	Reaction	Potential, volts
$2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2$	0.0000	$\text{In}^{2+} + \text{e}^- \rightarrow \text{In}^{+1}$	-0.40
$\text{D}^+ + \text{e}^- \rightarrow 1/2\text{D}_2$	-0.0034	$\text{In}^{3+} + 2\text{e}^- \rightarrow \text{In}^{+1}$	-0.40
$\text{AgCN} + \text{e}^- \rightarrow \text{Ag} + \text{CN}^-$	-0.02	$\text{Mn}(\text{OH})_2 + \text{e}^- \rightarrow \text{Mn}(\text{OH})_2 + \text{OH}^-$	-0.40
$\text{TeO}_4^{2-} + 3\text{H}_2\text{O} + 4\text{e}^- \rightarrow \text{Te} + 6\text{OH}^-$	-0.02	$\text{Cd}^{2+} + 2\text{e}^- \rightarrow \text{Cd}$	-0.4026
$2\text{WO}_3 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{W}_2\text{O}_5 + \text{H}_2\text{O}$	-0.03	$\text{Fe}^{3+} + 2\text{e}^- \rightarrow \text{Fe}$	-0.409
$\text{Fe}^{3+} + 3\text{e}^- \rightarrow \text{Fe}$	-0.036	$\text{Cr}^{3+} + \text{e}^- \rightarrow \text{Cr}^{2+}$	-0.41
$\text{Ag}_2\text{S} + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{Ag} + \text{H}_2\text{S}$	-0.0366	$\text{Eu}^{3+} + \text{e}^- \rightarrow \text{Eu}^{2+}$	-0.43
$\text{P} + 3\text{H}^+ + 3\text{e}^- \rightarrow \text{PH}_3(\text{g})$	-0.04	$\text{CdSO}_4 \cdot 8/3\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Cd}(\text{Hg}) + \text{CdSO}_4 (\text{sat'd aq})$	-0.4346
$\text{W}_2\text{O}_5 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{WO}_3 + \text{H}_2\text{O}$	-0.04	$\text{Ti}_2\text{SO}_4 + 2\text{e}^- \rightarrow \text{Ti}(\text{Hg}) + \text{SO}_4^{2-}$	-0.4360
$\text{Hg}_2\text{I}_2 + 2\text{e}^- \rightarrow 2\text{Hg} + 2\text{I}^-$	-0.0405	$\text{Bi}_2\text{O}_3 + 3\text{H}_2\text{O} + 6\text{e}^- \rightarrow 2\text{Bi} + 6\text{OH}^-$	-0.46
$2\text{D}^+ + 2\text{e}^- \rightarrow \text{D}_2$	-0.044	$\text{Bi}(\text{OH}) + \text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{Bi} + 3\text{OH}^-$	-0.46
$\text{Ti}(\text{OH})_3 + 2\text{e}^- \rightarrow \text{TiOH} + 2\text{OH}^-$	-0.05	$\text{NO}_2^- + \text{H}_2\text{O} + \text{e}^- \rightarrow \text{NO} + 2\text{OH}^-$	-0.46
$\text{O}_2 + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{HO}_2^- + \text{OH}^-$	-0.076	$\text{S} + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{HS}^- + \text{OH}^-$	-0.478
$\text{AsO}_4^{3-} + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{AsO}_2^- + 4\text{OH}^- (\text{if NaOH})$	-0.08	$\text{H}_3\text{PO}_3 + 3\text{H}^+ + 3\text{e}^- \rightarrow \text{P} + 3\text{H}_2\text{O}$	-0.49
$2\text{H}_2\text{SO}_3 + \text{H}^+ + 2\text{e}^- \rightarrow \text{HS}_2\text{O}_3^- + 2\text{H}_2\text{O}$	-0.08	$\text{In}^{3+} + \text{e}^- \rightarrow \text{In}^{+2}$	-0.49
$\text{Ru}^{3+} + \text{e}^- \rightarrow \text{Ru}^{+2} (1-6\text{fHCl})$	-0.084	$2\text{CO} + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2\text{C}_2\text{O}_4$	-0.49
$2\text{Cu}(\text{OH})_2 + 2\text{e}^- \rightarrow \text{Cu}_2\text{O} + 2\text{OH}^- + \text{H}_2\text{O}$	-0.09	$\text{H}_3\text{PO}_3 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_3\text{PO}_2 + \text{H}_2\text{O}$	-0.50
$\text{WO}_3 + 6\text{H}^+ + 6\text{e}^- \rightarrow \text{W} + 3\text{H}_2\text{O}$	-0.09		(-0.59)
$\text{Ru}^{3+} + \text{e}^- \rightarrow \text{Ru}^{+2} (0.1\text{fHClO}_4)$	-0.11	$\text{S} + 2\text{e}^- \rightarrow \text{S}^{2-}$	-0.508
$\text{Cr}^{3+} + 3\text{e}^- \rightarrow \text{Cr} (1\text{fNaOH})$	-0.12	$\text{H}_3\text{PO}_2 + \text{H}^+ + \text{e}^- \rightarrow \text{P} + 2\text{H}_2\text{O}$	-0.51
$\text{CrO}_4^{2-} + 4\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{Cr}(\text{OH})_3 + 5\text{OH}^-$	-0.12	$\text{Sb} + 3\text{H}^+ + 3\text{e}^- \rightarrow \text{H}_3\text{Sb}$	-0.51
$\text{GeO}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{GeO} + \text{H}_2\text{O}$	-0.12	$\text{As} + 3\text{H}^+ + 3\text{e}^- \rightarrow \text{AsH}_3$	-0.54
$\text{WO}_3 + 4\text{H}^+ + 4\text{e}^- \rightarrow \text{W} + 2\text{H}_2\text{O}$	-0.12	$\text{HPbO}_2^- + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Pb} + 3\text{OH}^-$	-0.54
$\text{Pb}^{2+} + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg})$	-0.1205	$\text{TiCl} + \text{e}^- \rightarrow \text{Ti}(\text{Hg}) + \text{Cl}^-$	-0.555
$\text{Pb}^{2+} + 2\text{e}^- \rightarrow \text{Pb}$	-0.1263	$\text{Cr}^{3+} + 2\text{e}^- \rightarrow \text{Cr}$	-0.557
	(0.126)	$\text{Ga}^{3+} + 3\text{e}^- \rightarrow \text{Ga}$	-0.560
$\text{H}_2\text{GeO}_4 + 4\text{H}^+ + 4\text{e}^- \rightarrow \text{Ge} + 3\text{H}_2\text{O}$	-0.13	$\text{Fe}(\text{OH})_3 + \text{e}^- \rightarrow \text{Fe}(\text{OH})_2 + \text{OH}^-$	-0.56
$\text{Sn}^{2+} + 2\text{e}^- \rightarrow \text{Sn}$	-0.1364	$\text{PbO} + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Pb} + 2\text{OH}^-$	-0.576
$\text{O}_2 + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{H}_2\text{O}_2 + 2\text{OH}^-$	-0.146	$2\text{SO}_4^{2-} + 3\text{H}_2\text{O} + 4\text{e}^- \rightarrow \text{S}_2\text{O}_3^{2-} + 6\text{OH}^-$	-0.58
$\text{AgI} + \text{e}^- \rightarrow \text{Ag} + \text{I}^-$	-0.1519	$\text{SbO}_3^- + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{SbO}_2^- + 2\text{OH}^-$	-0.59
$2\text{NO}_2^- + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow \text{N}_2\text{O}_4^{2-} + 4\text{OH}^-$	-0.18	$\text{TiBr} + \text{e}^- \rightarrow \text{Ti}(\text{Hg}) + \text{Br}^-$	-0.606
$\text{CO}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{HCOOH}$	-0.2	$\text{U}^{4+} + \text{e}^- \rightarrow \text{U}^{3+} (1\text{fHClO}_4)$	-0.61
$2\text{SO}_4^{2-} + 4\text{H}^+ + 2\text{e}^- \rightarrow \text{S}_2\text{O}_8^{2-} + 2\text{H}_2\text{O}$	-0.2	$\text{Ni}(\text{OH})_2 + 2\text{e}^- \rightarrow \text{Ni} + 2\text{OH}^-$	-0.62
$\text{Cu}(\text{OH})_2 + 2\text{e}^- \rightarrow \text{Cu} + 2\text{OH}^-$	-0.224	$\text{SbO}_2^- + 2\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{Sb} + 4\text{OH}^-$	-0.66
$\text{Ni}^{2+} + 2\text{e}^- \rightarrow \text{Ni}$	-0.23	$\text{AsO}_2^- + 2\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{As} + 4\text{OH}^-$	-0.66
$\text{PbHPO}_4 + \text{H}^+ + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg}) + \text{HPO}_4^-$	-0.2448	$*\text{Te} + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2\text{Te}(\text{Ag})$	-0.68
$\text{V}(\text{OH})_4 + 4\text{H}^+ + 5\text{e}^- \rightarrow \text{V} + 4\text{H}_2\text{O}$	-0.25		(-0.69)
$\text{V}^{3+} + \text{e}^- \rightarrow \text{V}^{2+}$	-0.255		(-0.72)
$\text{PbCl}_2 + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg}) + 2\text{Cl}^-$	-0.262		(-0.7051)
$\text{PbBr}_2 + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg}) + \text{Br}^-$	-0.275	$\text{Ag}_2\text{S} + 2\text{e}^- \rightarrow 2\text{Ag} + \text{S}^{2-}$	-0.71
$\text{H}_3\text{PO}_4 + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_3\text{PO}_3 + \text{H}_2\text{O}$	-0.276	$\text{Ta}_2\text{O}_5 + 10\text{H}^+ + 10\text{e}^- \rightarrow 2\text{Ta} + 5\text{H}_2\text{O}$	-0.71
	(-0.2)	$\text{AsO}_4^{3-} + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{AsO}_2^- + 4\text{OH}^-$	-0.73
$\text{Co}^{2+} + 2\text{e}^- \rightarrow \text{Co}$	-0.28	$\text{Co}(\text{OH})_2 + 2\text{e}^- \rightarrow \text{Co} + 2\text{OH}^-$	-0.73
$\text{Ti}^+ + \text{e}^- \rightarrow \text{Ti}(\text{Hg})$	-0.3338	$\text{H}_3\text{BO}_3 + 3\text{H}^+ + 3\text{e}^- \rightarrow \text{B} + 3\text{H}_2\text{O}$	-0.74
$\text{Ti}^+ + \text{e}^- \rightarrow \text{Ti}$	-0.3363	$\text{Cr}^{3+} + 3\text{e}^- \rightarrow \text{Cr}$	-0.74
$\text{In}^{3+} + 3\text{e}^- \rightarrow \text{In}$	-0.338	$\text{V}^{3+} + \text{e}^- \rightarrow \text{V}^{2+} (1\text{fNaOH})$	-0.74
$\text{PbF}_2 + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg}) + 2\text{F}^-$	-0.3444	$\text{Cd}(\text{OH})_2 + 2\text{e}^- \rightarrow \text{Cd}(\text{Hg}) + 2\text{OH}^-$	-0.761
$\text{TiOH} + \text{e}^- \rightarrow \text{Ti} + \text{OH}^-$	-0.3445		(-0.81)
$\text{SeO}_4^{2-} + 3\text{H}_2\text{O} + 4\text{e}^- \rightarrow \text{Se} + 6\text{OH}^-$	-0.35	$\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}$	-0.7628
$\text{PbSO}_4 + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg}) + \text{SO}_4^{2-}$	-0.3505	$\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}(\text{Hg})$	-0.7628
$\text{Cd}^{2+} + 2\text{e}^- \rightarrow \text{Cd}(\text{Hg})$	-0.3521	$\text{TiH} + \text{e}^- \rightarrow \text{Ti}(\text{Hg}) + \text{I}^-$	-0.769
$\text{PbSO}_4 + 2\text{e}^- \rightarrow \text{Pb} + \text{SO}_4^{2-}$	-0.356	$\text{Se} + 2\text{e}^- \rightarrow \text{Se}^{2-}$	-0.78
$\text{PbI}_2 + 2\text{e}^- \rightarrow \text{Pb}(\text{Hg}) + 2\text{I}^-$	-0.358	$\text{HSnO}_2^- + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Sn} + 3\text{OH}^-$	-0.79
$\text{Se} + 2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2\text{Se}(\text{aq})$	-0.36	$\text{ZnSO}_4 \cdot 7\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Zn}(\text{Hg}) + \text{SO}_4^{2-} (\text{Sat'd ZnSO}_4)$	-0.7993
$\text{Cu}_2\text{O} + \text{H}_2\text{O} + 2\text{e}^- \rightarrow 2\text{Cu} + 2\text{OH}^-$	-0.361	$\text{RuO}_2 + 4\text{H}^+ + 4\text{e}^- \rightarrow \text{Ru} + 2\text{H}_2\text{O}$	-0.8
$\text{Ti}^{2+} + \text{e}^- \rightarrow \text{Ti}^{+2}$	-0.37	$\text{ReO}_4^- + 4\text{H}_2\text{O} + 7\text{e}^- \rightarrow \text{Re} + 8\text{OH}^-$	-0.81

Tabel 2. Data keadaan fisik produk hasil elektrolisis pada berbagai pH.

No.	pH Filtrat limbah		Keadaan fisik produk
	awal	akhir	
1.	4,0	4,0	Coklat keputih-putihan, kasar, dan rontok.
2.	5,0	4,6	Coklat keputih-putihan, kuat.
3.	6,0	5,7	Putih kecoklatan, kuat.
4.	7,0	6,5	Putih sedikit kecoklatan, rontok.
5.	8,0	7,5	Putih sedikit kecoklatan, rontok.
6.	9,0	8,6	Putih sedikit kecoklatan, rontok.
7.	10,0	10,0	Putih bersih dan kuat.
8.	11,0	11,0	Putih bersih dan kuat.
9.	12,0	--	Sampel rusak sebelum dielektrolisis (timbul endapan kecoklatan dan larutan kuning).

Tabel 3. Data keadaan fisik produk hasil elektrolisis pada berbagai perbandingan campuran.

No.	Perbandingan (mL)		Keadaan fisik produk
	Filtrat Limbah	(NH ₄) ₂ CO ₃	
1.	4	1	Putih bersih.
2.	3	2	Putih, sedikit kecoklatan.
3.	2	1	Putih bersih.
4.	1	1	Putih kecoklatan.
5.	1	2	Coklat, rontok.
6.	2	3	Coklat kehitaman, rontok.
7.	1	4	Coklat kehitaman, rontok.

Tabel 4. Data massa deposit hasil elektrolisis.

Tabel 4.1. Massa deposit dan batang karbon.

No.	Waktu (menit)	Massa Elektroda (gram)					
		Sebelum Elektrolisis			Setelah Elektrolisis		
		1	2	3	1	2	3
1.	20'	4,9846	4,9850	4,9849	5,0134	5,0132	5,0132
2.	40'	5,0094	5,0091	5,0094	5,0674	5,0673	5,0675
3.	60'	4,9405	4,9407	4,9402	5,0158	5,0158	5,0157
4.	80'	4,9220	4,9221	4,9221	5,0014	5,0013	5,0014

Tabel 4.2. Massa deposit.

No.	Waktu (menit)	$M_{k.a}$	$M_{k.d.a}$	Massa Deposit (gram)
1.	20'	4,9848	5,0132	0,0284
2.	40'	5,0093	5,0674	0,0581
3.	60'	4,9404	5,0158	0,0754
4.	80'	4,9220	5,0014	0,0794

$M_{k.a}$ = massa rata-rata katoda sebelum elektrolisis (gram)

$M_{k.d.a}$ = massa rata-rata katoda sesudah elektrolisis (gram)

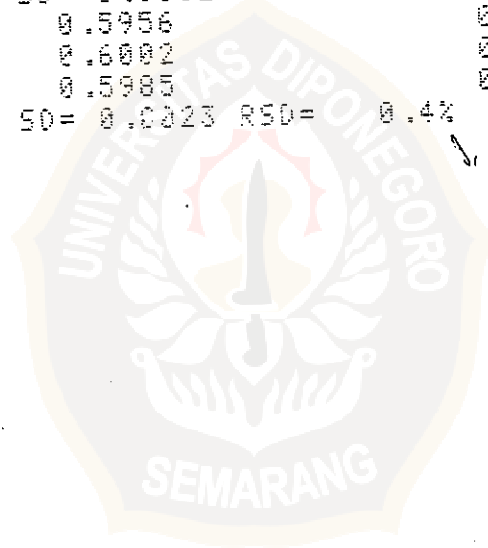
Data hasil analisis sampel perak menggunakan
Spektrofotometer Serapan Atom

HITACHI POLARIZED ZEPHYRUS ATOMIC ABSORPTION SPECTROPHOTOMETER
 ELEMENT : Ag
 DATE : 16.10.98
 SAMPLE : AIRCUCIFILM
 OPERATOR :
 ATOMIZATION : FLAME
 INSTRUMENTAL CONDITIONS
 LAMP CURRENT : 7.5 mA
 WAVELENGTH : 328.1 nm
 SLIT : 1.3 nm
 ATOMIZER : STD BURNER
 OXIDANT : AIR
 OXIDANT PRESSURE : 1.60 kg/cm²
 : (9.5 l/min)
 FUEL : C₂H₂
 FUEL PRESSURE : 0.30 kg/cm²
 : (2.3 l/min)
 BURNER HEIGHT : 7.5 mm

***** Ag RESULT TABLE *****

S.NO	CONC (PPM)	ABS	REFERENCE
1		-0.0003	-0.005
1		0.0000	-0.006
1		0.0000	-0.007
		MEAN=-0.0001 SD= 0.0001 RSD= 100.0%	
2		0.0116	-0.001
1 ppm		0.0125	-0.001
2		0.0134	-0.001
		MEAN= 0.0125 SD= 0.0009 RSD= 7.2%	
3		0.0299	-0.001
2 ppm		0.0311	-0.001
3		0.0314	-0.002
		MEAN= 0.0308 SD= 0.0008 RSD= 2.6%	
4		0.0593	0.000
4 ppm		0.0626	0.000
4		0.0630	0.000
		MEAN= 0.0616 SD= 0.0020 RSD= 3.2%	
5		0.1215	0.013
8 ppm		0.1211	0.012
5		0.1208	0.013
		MEAN= 0.1211 SD= 0.0003 RSD= 0.2%	
6		0.1866	0.019
12 ppm		0.1856	0.019
6		0.1856	0.019
		MEAN= 0.1859 SD= 0.0005 RSD= 0.3%	
7		0.2521	0.025
16 ppm		0.2510	0.025
7		0.2512	0.025
		MEAN= 0.2514 SD= 0.0005 RSD= 0.2%	
8		0.3199	0.032
20 ppm		0.3207	0.033
8		0.3205	0.032
		MEAN= 0.3204 SD= 0.0004 RSD= 0.1%	
9		0.3898	0.040
25 ppm		0.3891	0.040
9		0.3892	0.040
		MEAN= 0.3894 SD= 0.0003 RSD= 0.1%	

	10	-0.0004		-0.001
	10	-0.0006		0.000
\bar{f}_q	10	-0.0007		0.000
		MEAN= -0.0006	SD= 0.0001	RSD= -16.7%
	11	0.1632		0.018
	11	0.1632		0.018
x1.	11	0.1628		0.018
		MEAN= 0.1631	SD= 0.0002	RSD= 0.1%
	12	0.3277		0.036
	12	0.3308		0.036
x2.	12	0.3325		0.036
		MEAN= 0.3303	SD= 0.0024	RSD= 0.7%
	13	0.3892		0.043
	13	0.3894		0.043
x3.	13	0.3904		0.043
		MEAN= 0.3897	SD= 0.0006	RSD= 0.2%
	14	0.4124		0.045
	14	0.4099		0.045
4.	14	0.4115		0.045
		MEAN= 0.4113	SD= 0.0012	RSD= 0.3%
	15	0.5956		0.069
	15	0.6002		0.069
5.	15	0.5985		0.069
		MEAN= 0.5981	SD= 0.0023	RSD= 0.4%



Tabel 5. Data absorbansi larutan AgNO_3 standar.
(hasil analisa Spektrofotometer Serapan Atom)

No.	Konsentrasi (ppm)	Absorbansi
1.	1	0,0125
2.	2	0,0308
3.	4	0,0616
4.	8	0,1211
5.	12	0,1859
6.	16	0,1514
7.	20	0,3204
8.	25	0,3894

Tabel 6. Data absorbansi perak dalam sampel.
(hasil analisa spektrofotometer Serapan Atom)

No.	Sampel	Waktu Elektrolisis (menit)	Absorbansi
1.	1.a.	20'	0,1631
2.	2.a.	40'	0,3303
3.	3.a.	60'	0,3897
4.	4.a.	80'	0,4113

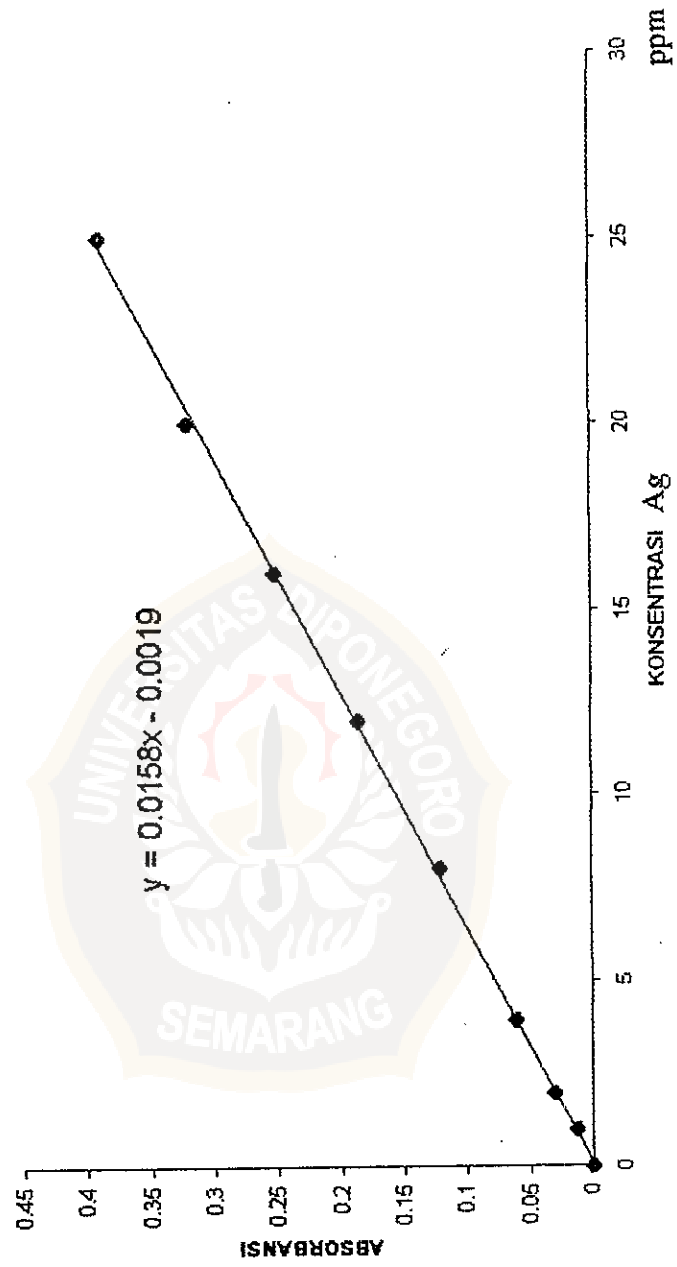
Tabel 7. Data konsentrasi perak dalam sampel.

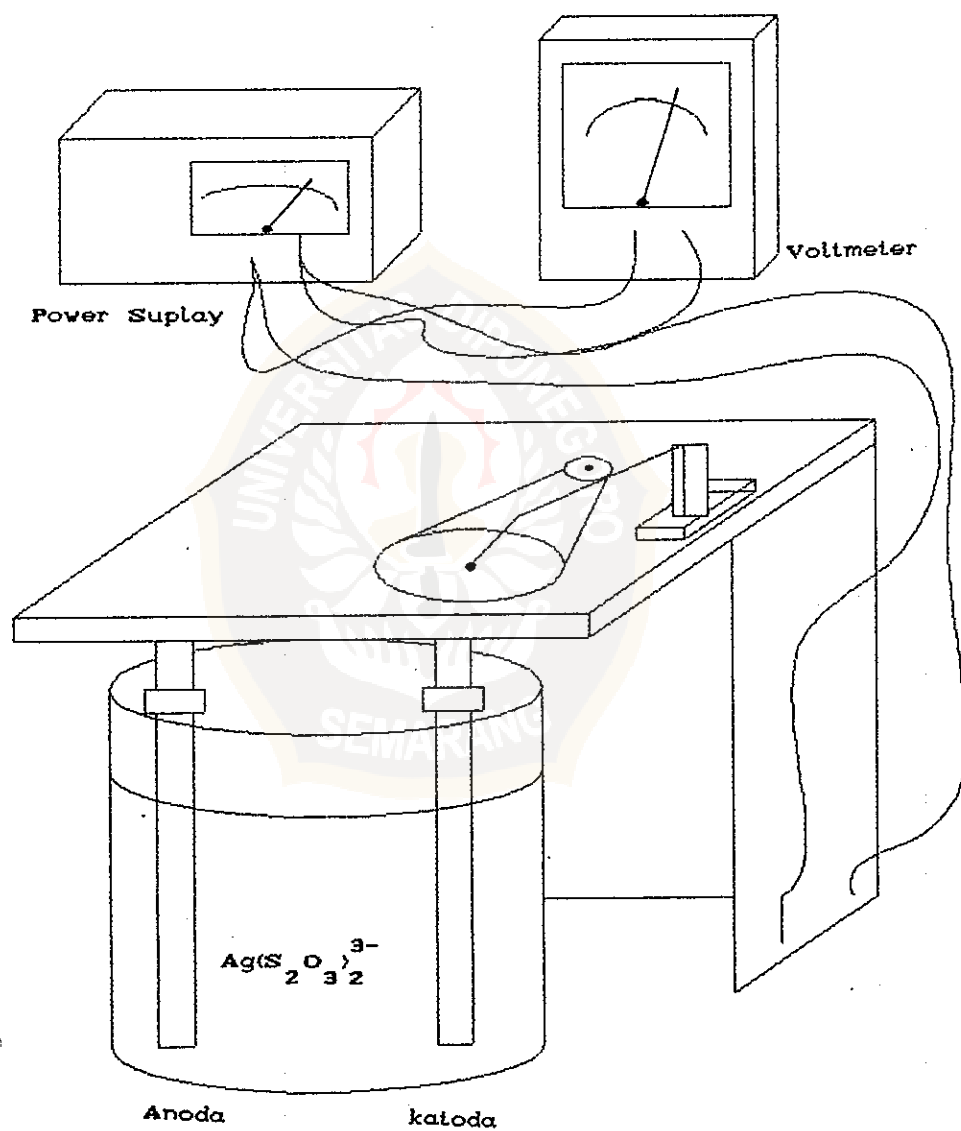
No.	No. Sampel	Absorbansi	Konsentrasi (ppm)
1.	1.a.	0,1631	10,5
2.	2.a.	0,3303	21,3
3.	3.a.	0,3897	25,1
4.	4.a.	0,4113	26,5



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GRAFIK KONSENTRASI PERAK STANDAR



Gambar 1. Perangkat alat elektrolisis

1. Massa perak secara teoritis.

Diketahui :

$$I = 26 \text{ mA} = 26 \times 10^{-3} \text{ A.}$$

$$BM_{Ag} = 107,9 \text{ g/mol}$$

$$n = 1$$

Rumus.

$$W = \frac{BM \cdot I \cdot t}{n \cdot 96500}$$

a. Lama elektrolisa 20 menit.

$$W = \frac{107,9 \cdot 26 \times 10^{-3} \cdot 20 \cdot 60}{1 \cdot 96500} = 0,0348 \text{ g}$$

b. Lama elektrolisis 40 menit.

$$W = \frac{107,9 \cdot 26 \times 10^{-3} \cdot 40 \cdot 60}{1 \cdot 96500} = 0,0697 \text{ g}$$

c. Lama elektrolisis 60 menit.

$$W = \frac{107,9 \cdot 26 \times 10^{-3} \cdot 60 \cdot 60}{1 \cdot 96500} = 0,1 \text{ g}$$

d. Lama elektrolisis 80 menit.

$$W = \frac{107,9 \cdot 26 \times 10^{-3} \cdot 80 \cdot 60}{1 \cdot 96500} = 0,139 \text{ g}$$

2. Massa perak hasil analisa dengan AAS.

Diketahui :

Banyaknya pengenceran = 100 kali

Volume Sampel = 25 ml

a. Lama elektrolisis 20 menit.

$$10,5 \times 100 \times 25 \cdot 10^{-3} = 26,25 \text{ mg.}$$

b. Lama elektrolisis 40 menit.

$$21,3 \times 100 \times 25 \cdot 10^{-3} = 53,25 \text{ mg.}$$

c. Lama elektrolisis 60 menit.

$$25,1 \times 100 \times 25 \cdot 10^{-3} = 62,75 \text{ mg.}$$

d. Lama elektrolisis 80 menit.

$$26,5 \times 100 \times 25 \cdot 10^{-3} = 66,25 \text{ mg.}$$

3. Efisiensi metoda elektrolisis.

a. Lama elektrolisis 20 menit.

Massa deposit = - secara teoritis = 0,0348 g

- hasil elektrolisis = 0,0284 g

$$\text{Efisiensi} = \frac{0,0284}{0,0348} \times 100\% = 81,61\%$$

b. Lama elektrolisis 40 menit.

Massa deposit = - secara teoritis = 0,0697 g

- hasil elektrolisis = 0,0581 g

$$\text{Efisiensi} = \frac{0,0581}{0,0697} \times 100\% = 83,36\%$$

c. Lama elektrolisis 60 menit.

Massa deposit = - secara teoritis = 0,1 g

- hasil elektrolisis = 0,0754 g

$$\text{Efisiensi} = \frac{0,0754}{0,1} \times 100\% = 75,4\%$$

d. Lama elektrolisis 80 menit.

Massa deposit = - secara teoritis = 0,139 g

- hasil elektrolisis = 0,0794 g

$$\text{Efisiensi} = \frac{0,0794}{0,139} \times 100\% = 57,1\%$$

4. Kemurnian Perak hasil elektrolisis.

a. Lama elektrolisis 20 menit.

Massa deposit = - hasil analisa AAS = 26,25 g

- hasil elektrolisis = 28,40 g

$$\text{Kemurnian} = \frac{26,25}{28,40} \times 100\% = 92,43\%$$

b. Lama elektrolisis 40 menit.

Massa deposit = - hasil analisa AAS = 53,25 g

- hasil elektrolisis = 58,10 g

$$\text{Kemurnian} = \frac{53,25}{58,10} \times 100\% = 91,65\%$$

c. Lama elektrolisis 60 menit.

Massa deposit = - hasil analisa AAS = 62,75 g

- hasil elektrolisis = 75,40 g

$$\text{Kemurnian} = \frac{62,75}{75,40} \times 100\% = 83,22\%$$

d. Lama elektrolisis 80 menit.

Massa deposit = - hasil analisa AAS = 66,25 g

- hasil elektrolisis = 79,40 g

$$\text{Kemurnian} = \frac{66,25}{79,40} \times 100\% = 83,44\%$$