

## DAFTAR PUSTAKA

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## **LAMPIRAN A**

### **DOKUMENTASI PENELITIAN**



Agregat halus pantai Barombong



Agregat Halus Sungai Jeneberang (Gowa)



Agregat Kasar PT. Prima Beton (Gowa)



Sampel pengujian kadar lumpur



Pengeringan oven pada proses uji kadar air



Sampel pengujian berat jenis agregat halus



Pengujian keausan agregat kasar dengan mesin loss angles



Proses penuangan bahan penyusun beton kedalam molen



Pengujian Slump



Model Sampel Beton Silinder



Pengujian Kuat Tekan Beton umur 3 hari

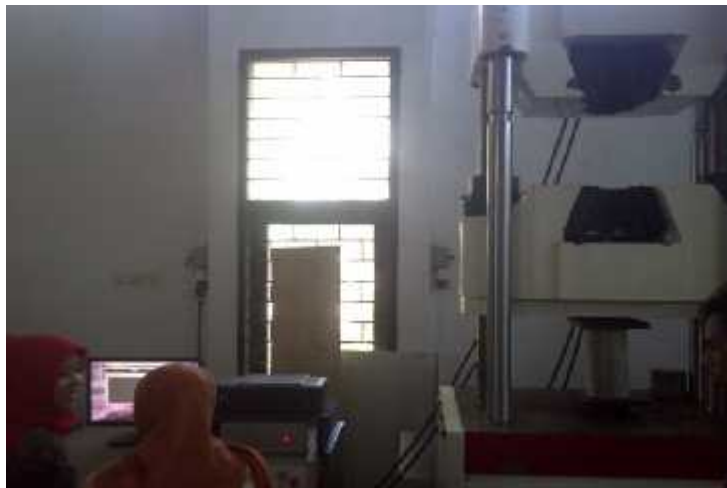


Pengujian Kuat Tekan Beton umur 7 hari





Pengujian Kuat Tekan Beton umur 28 hari

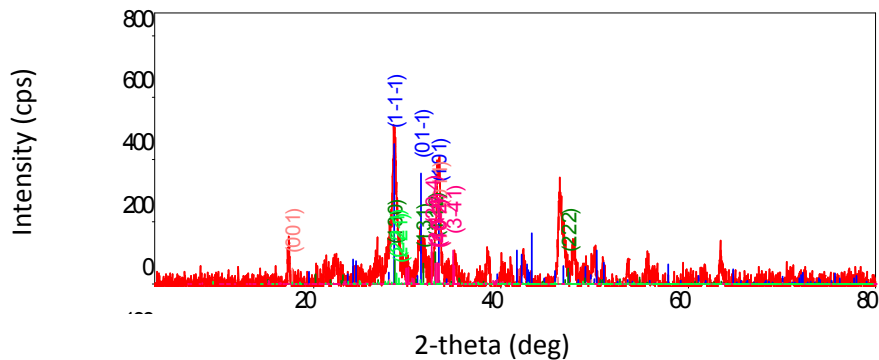


Pengujian Elastisitas Beton



## **LAMPIRAN B**

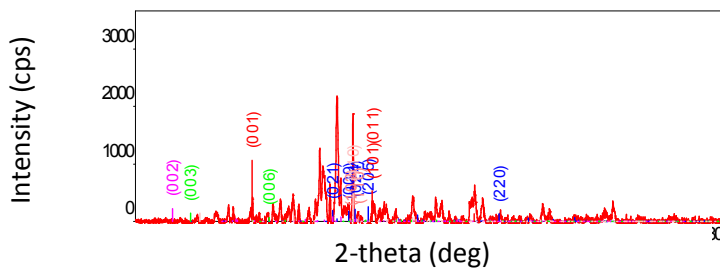
### **HASIL PENGUJIAN MIKROSTRUKTUR**



### Quantitative analysis results (RIR)

Phase name	Content(%)
Portlandite, Ca(OH) <sub>2</sub>	10.23
Tobermorite, 3CaO.2SiO <sub>2</sub> .3H <sub>2</sub> O	30.77
Garam Friedel, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaCl <sub>2</sub> .10H <sub>2</sub> O	0.3
Ettringite, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaSO <sub>4</sub> .32H <sub>2</sub> O	0.82
Trikalsium silikat, 3CaO.SiO <sub>2</sub>	20.16
Dikalsium silikat, 2CaO.SiO <sub>2</sub>	37.72
Trikalsium aluminat, 3CaO.Al <sub>2</sub> O <sub>3</sub>	-
Tetrakalsium Aluminoferrit, 4CaO.Al <sub>2</sub> O <sub>3</sub> . Fe <sub>2</sub> O <sub>3</sub>	-

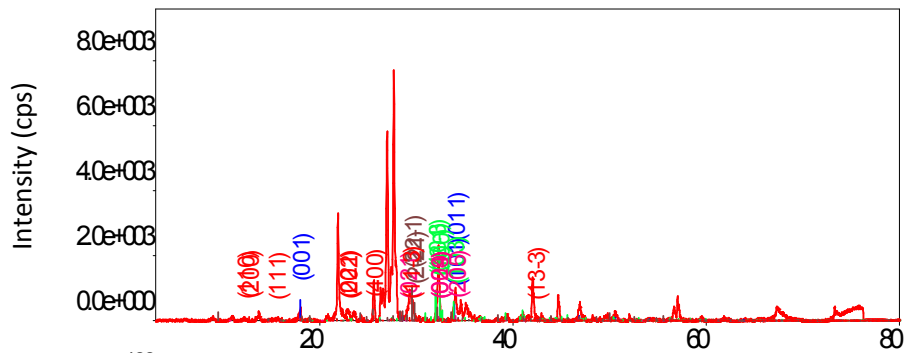
### Grafik dan Data XRD 1 Hari



### Quantitative analysis results (RIR)

Phase name	Content(%)
Portlandite, Ca(OH) <sub>2</sub>	9.37
Tobermorite, 3CaO.2SiO <sub>2</sub> .3H <sub>2</sub> O	34.72
Garam Friedel, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaCl <sub>2</sub> .10H <sub>2</sub> O	1.39
Ettringite, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaSO <sub>4</sub> .32H <sub>2</sub> O	2.6
Trikalsium silikat, 3CaO.SiO <sub>2</sub>	16.61
Dikalsium silikat, 2CaO.SiO <sub>2</sub>	35.31
Trikalsium aluminat, 3CaO.Al <sub>2</sub> O <sub>3</sub>	-
Tetrakalsium Aluminoferrit, 4CaO.Al <sub>2</sub> O <sub>3</sub> . Fe <sub>2</sub> O <sub>3</sub>	-

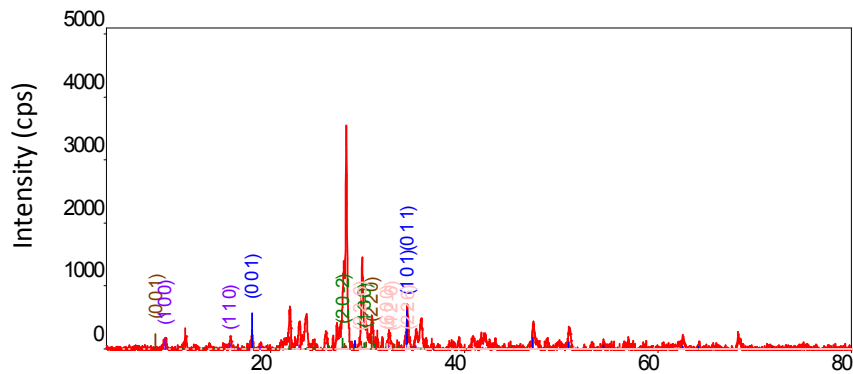
### Grafik dan Data XRD 3 Hari



### Quantitative analysis results (RIR)

Phase name	Content(%)
Portlandite, Ca(OH) <sub>2</sub>	7.58
Tobermorite, 3CaO.2SiO <sub>2</sub> .3H <sub>2</sub> O	43.63
Garam Friedel, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaCl <sub>2</sub> .10H <sub>2</sub> O	3.25
Ettringite, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaSO <sub>4</sub> .32H <sub>2</sub> O	4.83
Trikalsium silikat, 3CaO.SiO <sub>2</sub>	9.5
Dikalsium silikat, 2CaO.SiO <sub>2</sub>	31.21
Trikalsium aluminat, 3CaO.Al <sub>2</sub> O <sub>3</sub>	-
Tetrakalsium Aluminoferrit, 4CaO.Al <sub>2</sub> O <sub>3</sub> . Fe <sub>2</sub> O <sub>3</sub>	-

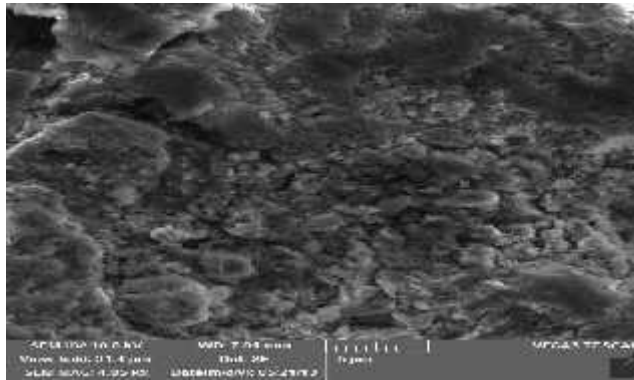
### Grafik dan Data XRD 7 Hari



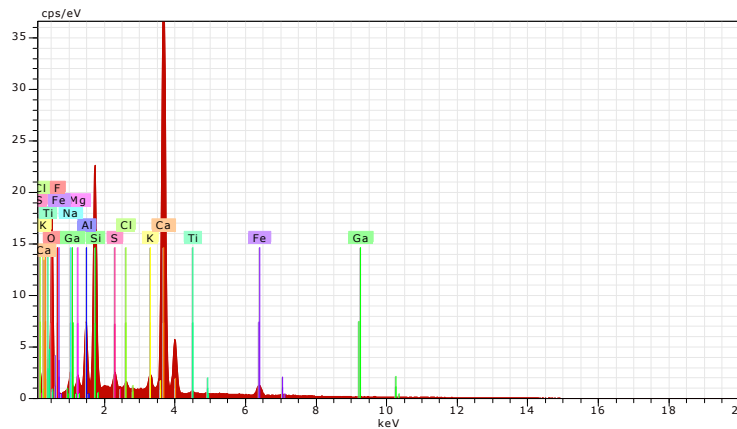
### Quantitative analysis results (RIR)

Phase name	Content(%)
Portlandite, Ca(OH) <sub>2</sub>	6.18
Tobermorite, 3CaO.2SiO <sub>2</sub> .3H <sub>2</sub> O	58.66
Garam Friedel, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaCl <sub>2</sub> .10H <sub>2</sub> O	7.71
Ettringite, 3CaO.Al <sub>2</sub> O <sub>3</sub> .CaSO <sub>4</sub> .32H <sub>2</sub> O	6.38
Trikalsium silikat, 3CaO.SiO <sub>2</sub>	-
Dikalsium silikat, 2CaO.SiO <sub>2</sub>	20.93
Trikalsium aluminat, 3CaO.Al <sub>2</sub> O <sub>3</sub>	-
Tetrakalsium Aluminoferrit, 4CaO.Al <sub>2</sub> O <sub>3</sub> . Fe <sub>2</sub> O <sub>3</sub>	-
NaCl	0,06
MgCl	0,08

### Grafik dan Data XRD 28 Hari



Scan Electron Mikroskopy umur 1 hari

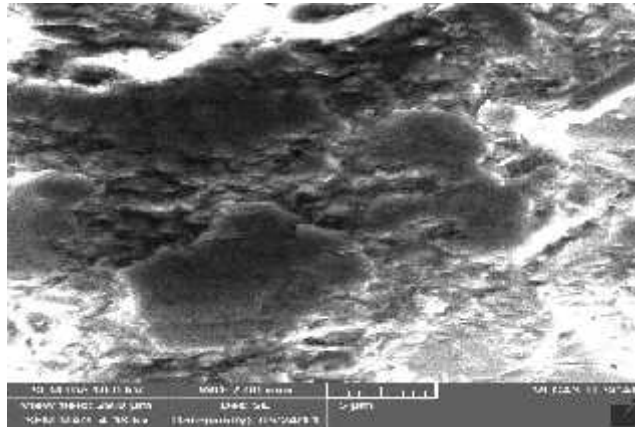


Grafik Scan Electron Mikroskopy umur 1 hari

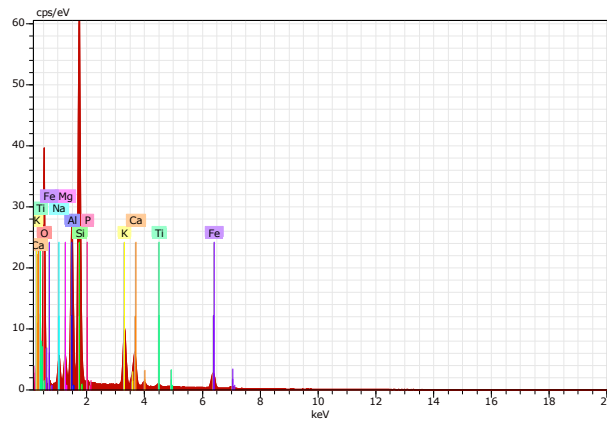
Spectrum: test

Element [wt.%]	unn. C [wt.%]	norm. C [at.%]	Atom. C	Compound	norm. Comp. C [wt.%]	Error (3 Sigma) [wt.%]
Oxygen	26.19	35.37	54.77		0.00	9.82
Silicon	7.81	10.55	9.31	SiO2	22.58	1.09
Aluminium	2.76	3.73	3.42	Al2O3	7.04	0.49
Sodium	1.43	1.93	2.08	Na2O	2.60	0.38
Magnesium	0.57	0.77	0.79	MgO	1.28	0.19
Potassium	0.99	1.34	0.85	K2O	1.62	0.18
Calcium	29.60	39.86	24.04	CaO	56.37	2.77
Titanium	0.17	0.23	0.12	TiO2	0.38	0.11
Iron	2.10	2.83	1.26	FeO	3.64	0.28
Sulfur	0.55	0.74	0.57	SO3	1.85	0.15
Chlorine	1.21	1.75	1.17		1.75	0.10
Fluorine	0.60	0.81	1.05		0.81	0.62
Gallium	0.07	0.09	0.03		0.09	0.11
<b>Total:</b>	<b>74.05</b>	<b>100.00</b>	<b>100.00</b>			

Data SEM Umur 1 Hari



Scan Electron Mikroskopy umur 3 Hari

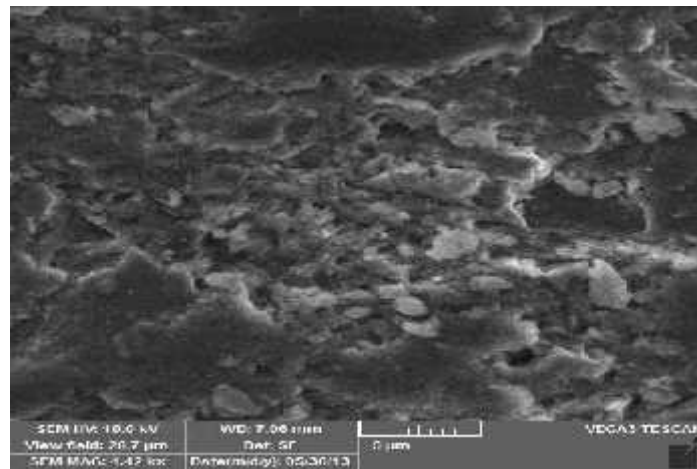


Grafik Scan Electron Mikroskopy umur 3 Hari

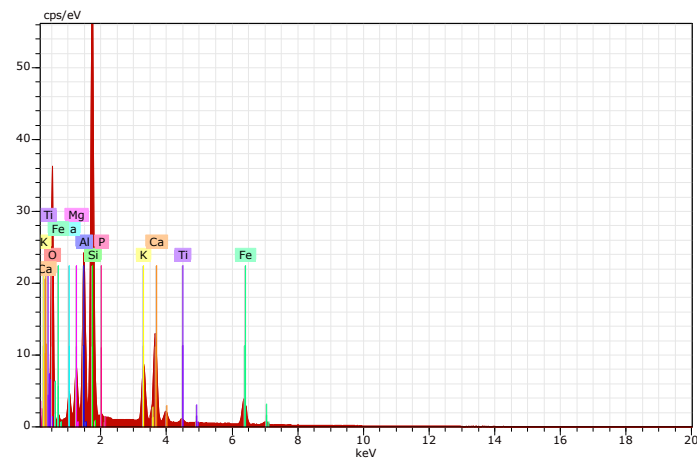
Spectrum: test

Element	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Compound	norm. Comp. C [wt.%]	Error (3 Sigma) [wt.%]
Oxygen	37.79	44.00	59.84		0.00	13.25
Silicon	19.55	22.76	17.63	SiO2	48.69	2.58
Aluminium	9.96	11.60	9.35	Al2O3	21.91	1.51
Sodium	2.78	3.24	3.06	Na2O	4.36	0.63
Magnesium	1.95	2.27	2.03	MgO	3.76	0.41
Potassium	5.21	6.06	3.37	K2O	7.30	0.56
Calcium	3.61	4.21	2.28	CaO	5.89	0.41
Titanium	0.42	0.49	0.22	TiO2	0.83	0.13
Chlorine	1.05	1.26	1.04		0.26	0.15
Iron	4.32	5.03	1.96	FeO	6.47	0.45
Phosphorus	0.29	0.34	0.24	P2O5	0.78	0.12
Total:	85.89	100.00	100.00			

Data SEM Umur 3 Hari



Scan Electron Mikroskopy umur 7 Hari

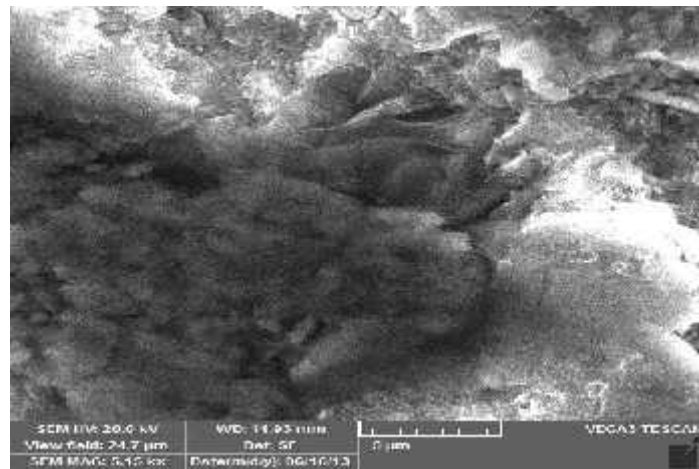


Grafik Scan Electron Mikroskopy umur 7 Hari

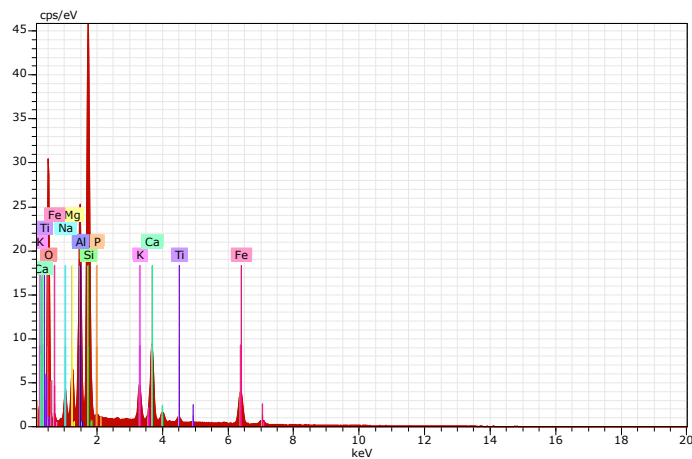
Spectrum: test

Element	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Compound	norm. Comp. C [wt.%]	Error (3 Sigma) [wt.%]
Oxygen	37.29	42.50	59.20		0.00	13.18
Silicon	18.23	20.78	16.49	SiO <sub>2</sub>	44.45	2.41
Aluminium	8.28	9.43	7.79	Al <sub>2</sub> O <sub>3</sub>	17.82	1.27
Sodium	2.33	2.66	2.58	Na <sub>2</sub> O	3.59	0.55
Magnesium	2.97	3.39	3.11	MgO	5.62	0.58
Potassium	4.17	4.75	2.71	K <sub>2</sub> O	5.73	0.47
Calcium	7.76	8.85	4.92	CaO	12.38	0.77
Iron	5.89	6.71	2.68	FeO	8.64	0.58
Chlorine	0.15	0.17	0.11		0.17	0.12
Titanium	0.47	0.53	0.25	TiO <sub>2</sub>	0.89	0.13
Phosphorus	0.34	0.38	0.28	P <sub>2</sub> O <sub>5</sub>	0.88	0.13
Total:	87.73	100.00	100.00			

Data SEM Umur 7 Hari



Scan Electron Mikroskopy umur 28 Hari



Grafik Scan Electron Mikroskopy umur 28 Hari

Spectrum: test

Element	unn. C [wt.%]	norm. C [wt.%]	Atom. C [at.%]	Compound	norm. Comp. C [wt.%]	Error (3 Sigma) [wt.%]
Oxygen	34.59	42.91	59.60		0.00	12.32
Silicon	15.98	19.82	15.68	SiO <sub>2</sub>	42.40	2.13
Aluminium	9.62	11.94	9.83	Al <sub>2</sub> O <sub>3</sub>	22.55	1.47
Sodium	1.96	2.43	2.35	Na <sub>2</sub> O	3.28	0.48
Potassium	2.22	2.76	1.57	K <sub>2</sub> O	3.32	0.29
Magnesium	2.61	3.23	2.96	MgO	5.36	0.52
Phosphorus	0.17	0.21	0.15	P <sub>2</sub> O <sub>5</sub>	0.49	0.11
Calcium	5.99	7.44	4.12	CaO	10.40	0.62
Titanium	0.58	0.72	0.33	TiO <sub>2</sub>	1.20	0.14
Iron	6.89	8.55	3.40	FeO	11.00	0.66
Chlorine	0.04	0.05	0.03		0.05	0.09

Data SEM Umur 28 Hari