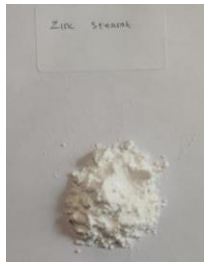


LAMPIRAN

1. Persiapan Alat dan Bahan

A



B



C



D



E



F



G



H



I



Keterangan A. Zinc Stearat, **B.** Serbuk Iron Powder, **C.** Serbuk Arang Batok Kelapa Carbon, **D.**Gelas **E.** Timbangan Digital **F.** Cetakan (*Die*) **G.** Hidrolik Press, **H.**Sendok, **I.** Sendok.

2. Pembuatan Spesimen



Keterangan A. Menimbang serbuk Iron Powder, **B.** Menimbang serbuk Arang Batok Kelapa Carbon, **C.** Menimbang Zinc Stearat, **D.** Penuangan serbuk spesimen paduan, **E.** Proses penekanan kompaksi spesimen dengan waktu tahan 10 menit, **F.** Penimbangan hasil spesimen setelah dikompaksi

3 .Proses Sintering

A



B



C



D



E



F



Keterangan **A.**Mesin furnace, **B.** Penataan spesimen untuk proses sintering, **C.** Mengatur temperature pada furnace, **D.** Waktu tahan temperature sinter, **E.**Spesimen setelah disinter, **F.** Proses pendinginan normalizing.

4. Proses Penuaan Spesimen

A

B

C



Keterangan A. Mengatur temperature untuk penuaan spesimen, **B.** Proses penuaan spesimen, **C.** Waktu tahan temperature sinter

5. Proses Pengujian Densitas

A

B



Keterangan A. Pengukuran ukuran spesimen serta pengambilan data tinggi spesimen, **B.** Penimbangan berat massa spesimen untuk pengambilan data

6. Proses pengujian Kekerasan Vickers

A



B



C



D



Keterangan A. Alat uji kekerasan vickers, B. Mengatur indentor load 100gf dan menempatkan spesimen C. Mendata hasil nilai pada uji kekerasan vickers, D. Hasil nilai data pada uji vickers.

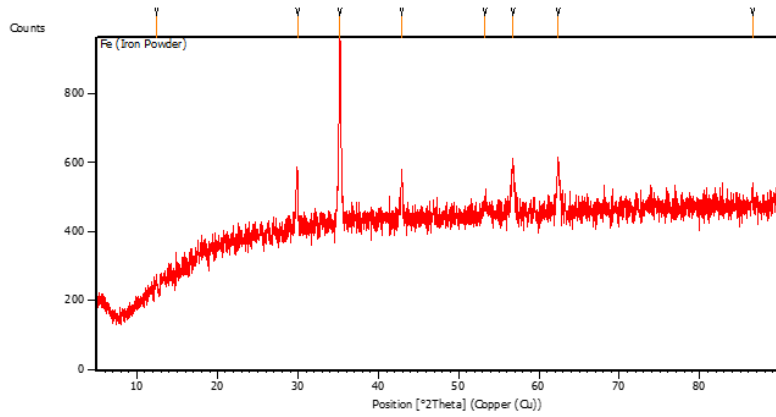
7. Data hasil pengujian XRD Serbuk Besi (*Iron Powder*)

This is the simple example template containing only headers for each report item and the bookmarks. The invisible bookmarks are indicated by text between brackets. Modify it according to your own needs and standards.

Measurement Conditions: (Bookmark 1)

Dataset Name	Fe (Iron Powder)
File name	E:\DATA PENGUJIAN-XRD\Pengujian
2023\April\Nugraha\Fe (Iron Powder) \Fe (Iron Powder) }d	
Comment	Configuration=Reflection-Transmission Sp Goniometer=PW3050/60 (Theta/Theta); Mini
Measurement Date / Time	4/25/2023 1:31:00 PM
Raw Data Origin	PHILIPS-binary (scan) (RD)
Scan Axis	Gonio
Start Position [°2Th.]	5.0084
End Position [°2Th.]	89.9744
Step Size [°2Th.]	0.0170
Scan Step Time [s]	10.1500
Scan Type	Continuous
Offset [°2Th.]	0.0000
Divergence Slit Type	Fixed
Divergence Slit Size [°]	1.0000
Specimen Length [mm]	10.00
Receiving Slit Size [mm]	12.7500
Measurement Temperature [°C]	-273.15
Anode Material	Cu
K-Alpha1 [Å]	1.54060
K-Alpha2 [Å]	1.54443
K-Beta [Å]	1.39225
K-A2 / K-A1 Ratio	0.50000
Generator Settings	30 mA, 40 kV
Diffractometer Type	XPert MPD
Diffractometer Number	1
Goniometer Radius [mm]	200.00
Dist. Focus-Diverg. Slit [mm]	91.00
Incident Beam Monochromator	No
Spinning	Yes

Main Graphics, Analyze View: (Bookmark 2)



Peak List: (Bookmark 3)

Pos. [°2Th.]	Height [cts]	FWHM Left [°2Th.]	d-spacing [Å]	Rel. Int. [%]
12.4366	23.92	0.4015	7.11742	4.59
29.9155	169.82	0.2007	2.98690	32.57
35.1778	521.35	0.0669	2.55121	100.00
42.8568	131.09	0.1673	2.11020	25.14
53.3120	34.27	0.8029	1.71842	6.57
56.7229	142.44	0.2676	1.62292	27.32
62.3318	147.65	0.2007	1.48968	28.32
86.4731	53.10	0.2007	1.12544	10.19

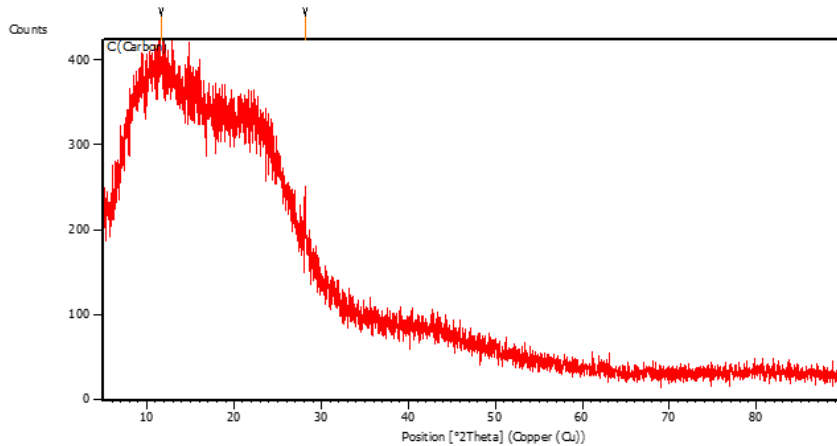
8. Data Hasil Pengujian XRD Arang Batok Kelapa (*Carbon*)

This is the simple example template containing only headers for each report item and the bookmarks. The invisible bookmarks are indicated by text between brackets. Modify it according to your own needs and standards.

Measurement Conditions: (Bookmark 1)

Dataset Name	C (Carbon)
File name	E:\DATA PENGUJIAN-XRD\Pengujian
2023\April\Nugraha\C (Carbon)\C (Carbon).rd	
Comment	Configuration=Reflection-Transmission Sp Goniometer=PW3050/60 (Theta/Theta); Mini
Measurement Date / Time	4/25/2023 1:40:00 PM
Raw Data Origin	PHILIPS-binary (scan) (RD)
Scan Axis	Gonio
Start Position [°2Th.]	5.0084
End Position [°2Th.]	89.9744
Step Size [°2Th.]	0.0170
Scan Step Time [s]	10.1500
Scan Type	Continuous
Offset [°2Th.]	0.0000
Divergence Slit Type	Fixed
Divergence Slit Size [°]	1.0000
Specimen Length [mm]	10.00
Receiving Slit Size [mm]	12.7500
Measurement Temperature [°C]	-273.15
Anode Material	Cu
K-Alpha1 [Å]	1.54060
K-Alpha2 [Å]	1.54443
K-Beta [Å]	1.39225
K-A2 / K-A1 Ratio	0.50000
Generator Settings	30 mA, 40 kV
Diffraction Type	XPert MPD
Diffraction Number	1
Goniometer Radius [mm]	200.00
Dist. Focus-Diverg. Slit [mm]	91.00
Incident Beam Monochromator	No
Spinning	Yes

Main Graphics, Analyze View: (Bookmark 2)



Peak List: (Bookmark 3)

Pos. [°2Th.]	Height [cts]	FWHM Left [°2Th.]	d-spacing [Å]	Rel. Int. [%]
11.6244	78.00	0.0900	7.60652	100.00
28.1410	64.84	0.1020	3.16844	83.13

9. Data Hasil Uji Densitas

IRON POWDER 99%, 98%, 97% - CARBON 1%, 2%, 3%

Waktu	Komposisi	Kodevikasi	Massa (gr)	r ² (mm)	T (mm)	
30Menit	1%	A1	a	7,997	100	6,99
			b	7,935	100	6,97
			c	7,974	100	6,99
	2%	A2	a	7,902	100	6,9
			b	7,969	100	6,99
			c	7,998	100	7,02
	3%	A3	a	7,800	100	7,23
			b	7,850	100	7,12
			c	7,691	100	7,23
60 Menit	1%	B1	a	7,962	100	7,44
			b	7,938	100	7,47
			c	7,999	100	7,49

	2%	B2	a	7,975	100	7,51
			b	7,998	100	7,47
			c	8,000	100	7,52
	3%	B3	a	8,000	100	7,57
			b	7,961	100	7,46
			c	7,125	100	6,79
90 Menit	1%	C1	a	7,999	100	7,84
			b	7,999	100	7,96
			c	7,958	100	7,8
	2%	C2	a	7,839	100	7,78
			b	7,953	100	7,82
			c	7,999	100	7,86
	3%	C3	a	7,824	100	7,75
			b	7,733	100	7,65
			c	7,038	100	7,14

10. Data Hasil Pengujian Densitas *IRON POWDER* Murni

30	Fe-Murni	A4	a	7,999	100	6,39
			b	7,977	100	6,35
			c	8,000	100	6,42
60		B4	a	8,000	100	6,33
			b	8,000	100	6,36
			c	7,971	100	6,3
90		C4	a	8,000	100	6,35
			b	7,998	100	6,33
			c	7,990	100	6,32

11. Data Pengujian Kekerasan



KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET, DAN TEKNOLOGI
POLITEKNIK NEGERI MALANG
JURUSAN TEKNIK MESIN

Jl. Soekarno Hatta No.9 Jatimulyo, Lowokwaru, Malang, 65141
Telp. (0341) 404424 – 404425, Fax (0341) 404420,
<http://www.polinema.ac.id>

SURAT KETERANGAN
NOMOR : 32/LAB.TM/2023

Yang bertanda tangan dibawah ini :

Nama : Rafik Djoenaidi,ST
N I P : 19780125 200112 1 002
Jabatan : Pranata Laboratorium Pendidikan
Politeknik Negeri Malang

Menerangkan dengan sesungguhnya bahwa mahasiswa :

NO	Nama	NIM/NPM	Prodi	Instansi
1	Ridhlo Tangguh H	1421900029	S-1 Teknik Mesin	Universitas 17 Agustus 1945 Surabaya

Benar benar telah melaksanakan pengambilan data di Jurusan Teknik Mesin Politeknik Negeri Malang, guna keperluan penyusunan skripsi.

Demikian surat keterangan ini dibuat untuk dipergunakan sebagaimana mestinya.

Malang, 25 Mei 2023

Pranata Laboratorium Pendidikan
Politeknik Negeri Malang

LAB. BAHAN TEKNIK MESIN
POLITEKNIK NEGERI MALANG

Rafik Djoenaidi,ST

19780125 200112 1 002

TABEL NILAI UJI KEKERASAN MICRO VICKERS HARDNESS TESTER

Kompaksi (Psi)	Komposisi (%)	Waktu tahan (menit)	Suhu (°C)	Spesimen	Nilai kekerasan (HVN)
9000	1%	30	1000	a	749,9
				b	744,7
				c	682,0
		60		a	604,1
				b	806,9
				c	770,9
		90		a	824,2
				b	828,0
				c	880,2
9000	2%	30	1000	a	558,6
				b	682,8
				c	453,2
		60		a	506,2
				b	855,2
				c	625,4
		90		a	787,5
				b	586,9
				c	608,3
9000	3%	30	1000	a	674,6
				b	728,0
				c	657,3
		60		a	613,2
				b	648,5
				c	702,0
		90		a	572,0
				b	586,6
				c	321,7
9000	Fe-Murni	30	1000	a	708,3
				b	789,1
				c	795,3
		60		a	591,6
				b	766,4
				c	675,4
		90		a	582,3
				b	615,7
				c	604,1

PELOUHAN & PERLAKUAN
B HAI
LAB. BAHAN TEKNIK MESIN
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