

## DAFTAR PUSTAKA

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## LAMPIRAN

### LAMPIRAN 1. Alat, Bahan dan Hasil Penelitian



Neraca Digital



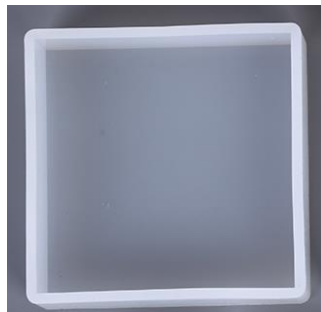
Mixing (Retsch MM 400)



Magnetic Stirrer



Magnetic Bar



Cetakan



Furnace



Spatula



Gelas Ukur



Gelas Kimia



FTIR



XRD



SEM



*X-Ray Mobile*



*Multimeter X-ray*

**Gambar 1. Alat Penelitian**





*Polyvinyl Alcohol (PVA)*



Akuades



Fe



Cu



Karbon Hitam (BC)



Selulosa

**Gambar 2.** Bahan Penelitian



**Gambar 3.** Hasil Penelitian

## LAMPIRAN 2. Dokumentasi Penelitian



Selulosa, Fe, Cu dan Karbon Hitam setelah di timbang



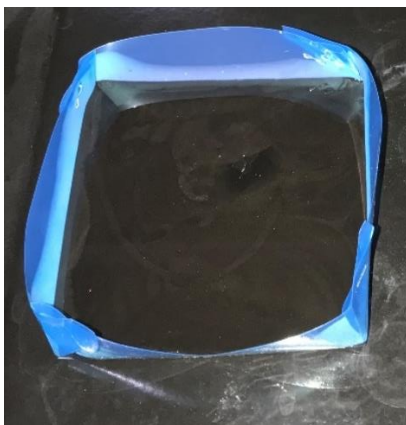
Fe, Cu dan Karbon Hitam di campur menggunakan *Retsch MM 400* selama 30 menit frekuensi 10 Hz



Larutan PVA



Komposit Selulosa/Fe-Cu/Karbon Hitam/PVA diaduk menggunakan *magnetic stirrer* pada suhu 160°C 900 rpm hingga menjadi gel.



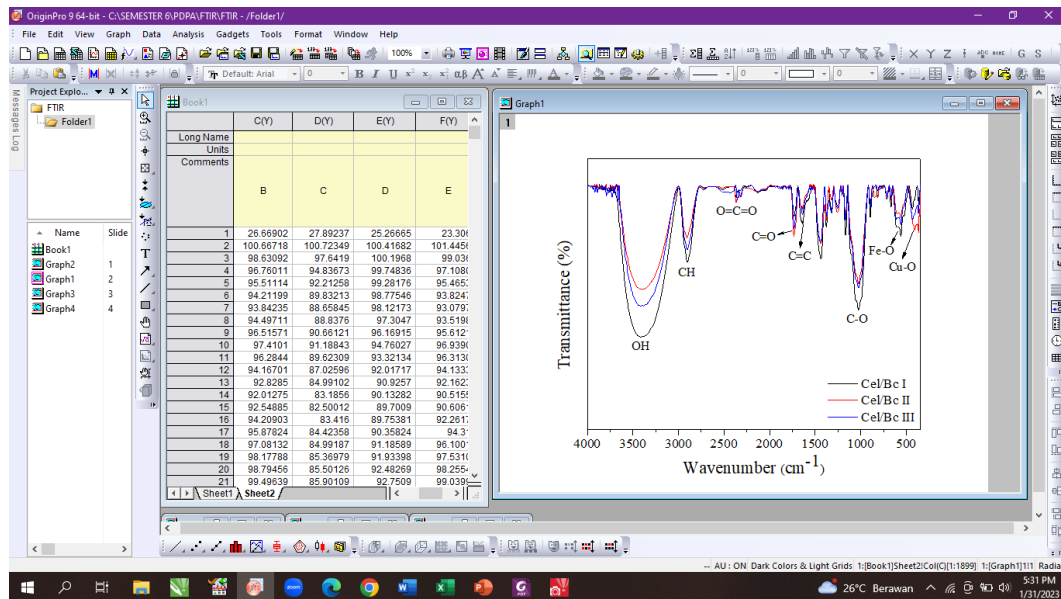
. Larutan gel dituang ke dalam cetakan (10 cm x 10 cm x 2 cm)



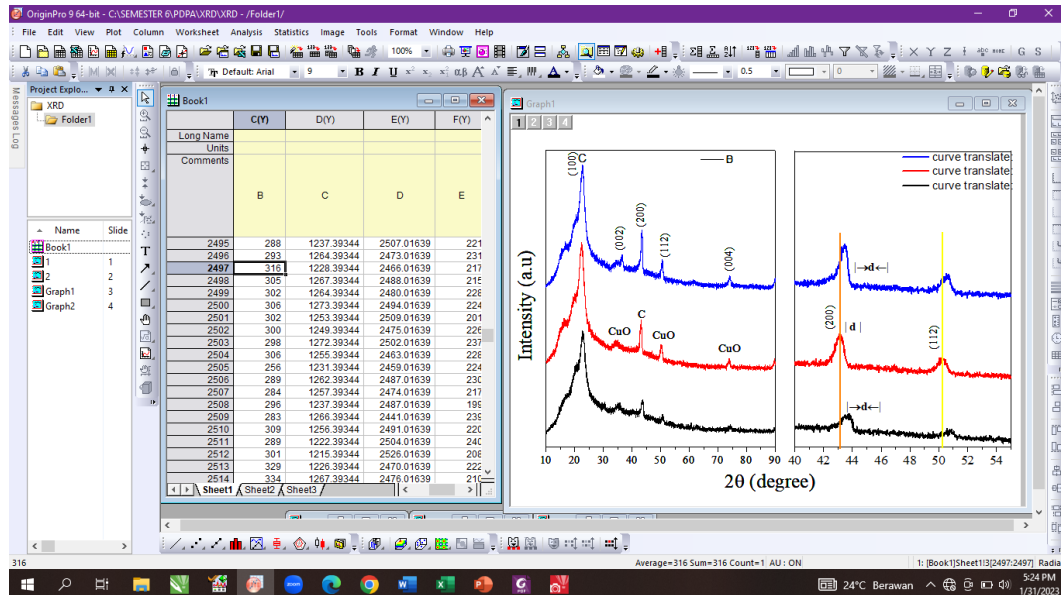
dipanaskan menggunakan *furnace* selama 12 jam pada suhu 70°C

## LAMPIRAN 3. Analisis Data

### 1. Data Fourier Transforms Infra-Red (FTIR)



### 2. X-Ray Diffraction (XRD)



**Tabel 1.** Rata-rata ukuran kristal sampel Cel/Bc I

peak no.	K	$\lambda$ (nm)	$\beta$ (deg)	$2\theta$ (deg)	D (nm)
1	0,9	0,154	0,39901	22,6	20,29568443
2	0,9	0,154	0,31564	35,14	26,39015722
3	0,9	0,154	0,65789	43,8	13,009519
4	0,9	0,154	0,36697	50,9	23,96549947
5	0,9	0,154	0,35458	74,28	28,09471969
Rata-Rata Ukuran Kristal Cel/Bc I					22,35111596

**Tabel 2.** Rata-rata ukuran kristal sampel Cel/Bc II

peak no.	K	$\lambda$ (nm)	$\beta$ (deg)	$2\theta$ (deg)	D (nm)
1	0,9	0,154	0,44526	22,28	18,17746106
2	0,9	0,154	0,26876	35,16	30,99512471
3	0,9	0,154	0,70152	43,12	12,17159032
4	0,9	0,154	0,69887	50,06	12,54064465
5	0,9	0,154	0,54512	73,92	18,23126577
Rata-Rata Ukuran Kristal Cel/Bc II					18,4232173

**Tabel 3.** Rata-rata ukuran kristal sampel Cel/Bc III

peak no.	K	$\lambda$ (nm)	$\beta$ (deg)	$2\theta$ (deg)	D (nm)
1	0,9	0,154	0,44439	22,64	18,22441195
2	0,9	0,154	0,78312	36,72	10,68433109
3	0,9	0,154	0,67066	43,46	12,74665801
4	0,9	0,154	0,77643	50,54	11,31014185
5	0,9	0,154	0,9338	74,12	10,6567913
Rata-Rata Ukuran Kristal Cel/Bc III					12,72446684

### 3. Data X-Ray Mobile

**Tabel 4.** Data Hasil Koefisien Attenuasi, Koefisien Attenuasi Massa, HVL dan MFP

Sampel	Thickness (cm)	Energy (keV)	I0	I	Koef. Attenuasi	HVL	MFP	Densitas (g/cm <sup>3</sup> )	Koef. Attenuasi Massa
Cel/Bc I	0,188	60	9,839	9,349	0,271727097	2,55	3,68016297	0,312934348	0,868319819
	0,188	70	14,16	13,46	0,269674277	2,57	3,70817718	0,312934348	0,861759914
	0,188	81	19,17	18,26	0,258689797	2,68	3,86563371	0,312934348	0,826658367
Cel/Bc II	0,144	60	9,839	9,28	0,406198146	1,71	2,46185269	0,312934348	1,298029919
	0,144	70	14,16	13,44	0,362401064	1,91	2,7593738	0,312934348	1,158073781
	0,144	81	19,17	18,09	0,402689289	1,72	2,48330419	0,312934348	1,28681716
Cel/Bc III	0,108	60	9,839	9,51	0,31490929	2,2	3,17551762	0,312934348	1,006311042
	0,108	70	14,16	13,5	0,441957434	1,57	2,26266134	0,312934348	1,412300811
	0,108	81	19,17	18,33	0,414884215	1,67	2,41031103	0,312934348	1,325786758

