Lampiran

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LAMPIRAN 1: Data pembuatan dioda L-Or-S

a. Data deposisi lapisan tipis

Sampel	Daya RF	Teg. Einzel	Teg. Pendorong	Tekanan	Waktu Deposisi
1	150 watt	100 volt	300 volt	0,08 atm	3 menit
2	150 watt	100 volt	300 volt	0,08 atm	5 menit
3	150 watt	100 volt	350 volt	0,08 atm	7 menit
4	150 watt	100 volt	350 volt	0,08 atm	10 menit

b. Data deposisi elektroda

Sampel	Tekanan	Arus
1	1.00E-06 atm	150 Ampere
2	1.00E-06 atm	150 Ampere
3	1.00E-06 atm	150 Ampere
4	1.00E-06 atm	150 Ampere

c. Data pengukuran ketebalan

Sampel	Ketebalan(μm)	Waktu Deposisi(menit)
1	5,20±0,48	3
2	7,20±0,48	5
3	14,0±1,1	7
4	19,00±1,01	10

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LAMPIRAN 2: Data karakterisasi dioda L-Or-S

a. Data pengukuran kapasitansi-tegangan (C-V)

Tegangan (volt)	Kapasitansi (farad)			
	sampel 1	sampel 2	sampel 3	sampel 4
0	1,29E-12	9,82E-13	4,92E-13	3,62E-13
0,1	1,28E-12	9,67E-13	4,71E-13	3,51E-13
0,2	1,22E-12	9,43E-13	4,43E-13	3,41E-13
0,4	1,08E-12	9,11E-13	3,41E-13	3,26E-13
0,6	1,03E-12	8,78E-13	3,83E-13	3,13E-13
0,8	9,88E-13	8,55E-13	3,63E-13	2,99E-13
1	9,44E-13	8,37E-13	3,45E-13	2,88E-13
1,2	9,11E-13	8,26E-13	3,27E-13	2,79E-13
1,4	8,76E-13	7,78E-13	3,11E-13	2,71E-13
1,6	9,48E-13	7,58E-13	2,98E-13	2,63E-13
1,8	8,32E-13	7,43E-13	2,87E-13	2,54E-13
2	8,05E-13	7,23E-13	2,77E-13	2,48E-13
2,2	7,84E-13	7,07E-13	2,68E-13	2,43E-13
2,4	7,65E-13	6,89E-13	2,60E-13	2,35E-13
2,6	7,46E-13	6,88E-13	2,52E-13	2,29E-13
2,8	7,28E-13	6,63E-13	2,46E-13	2,25E-13
3	7,12E-13	6,51E-13	2,40E-13	2,19E-13
3,2	6,97E-13	6,39E-13	2,34E-13	2,15E-13
3,4	6,82E-13	6,27E-13	2,27E-13	2,11E-13
3,6	6,69E-13	6,16E-13	2,23E-13	2,07E-13
3,8	6,56E-13	6,06E-13	2,21E-13	2,03E-13
3,99	6,47E-13	5,97E-13	2,14E-13	1,99E-13

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b.Data pengukuran arus-tegangan (I-V)

1. Bias maju

Tegangan (volt)	Arus (ampere)			
	sampel 1	sampel 2	sampel 3	sampel 4
0	0	0	0	0
0,2	0,01	0	0	0
0,4	0,05	0,01	0,01	0,01
0,6	0,1	0,03	0,02	0,02
0,8	0,32	0,07	0,03	0,03
1	0,74	0,21	0,06	0,05
1,2	1,14	0,64	0,12	0,08
1,4	1,68	0,89	0,27	0,09
1,6	2,78	1,02	0,46	0,11
1,8	3,68	1,31	0,73	0,13
2	5,23	2,16	0,98	0,18
2,2	6,92	2,87	1,12	0,36
2,4	8,42	4,62	1,62	0,41
2,6	10,62	5,12	2,26	0,65
2,8	13,68	6,25	3,09	0,82
3	15,96	7,59	4,12	1,02
3,2	19,01	9,12	5,41	1,24
3,4		11,11	6,68	1,87
3,6		13,02	8,26	3,02
3,8		16,02	9,72	4,25
4			11,56	5,82
4,2			13,46	8,25
4,4			16,13	10,06
4,6			19,39	13,25
4,8				16,03
5				19,99

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2. Dibias mundur

Tegangan (volt)	Arus (mikroampere)			
	sampel 1	sampel 2	sampel 3	sampel 4
0	0	0	0	0
0,5	0,1	0,1	0,1	0,1
1	0,2	0,2	0,2	0,2
3	0,3	0,4	0,3	0,3
5	0,5	0,6	0,5	0,4
10	0,6	0,9	0,7	0,6
20	0,9	1,3	1,2	0,8
30	1,3	1,6	1,5	1,1
50	1,6	1,9	1,7	1,3
100	1,9	2,3	2,1	1,6
150	2,3	2,9	2,4	1,9
200		3,5	2,8	2,3
232			3,2	2,8
250			3,4	3,2
300			3,9	3,6
310				4,3
350				5,2
380				

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LAMPIRAN 3: Data karakteristik arus-tegangan (I-V) dioda Schottky

Tegangan(Volt)	Arus (Ampere)
0	0
0,2	0,08
0,4	0,12
0,6	0,87
0,8	1,92
1	3,14
1,2	5,02
1,4	7,32
1,6	9,98
1,8	12,02
2	14,42
2,2	19,89
2,4	25,9
2,6	34,9
2,8	49,99
3	60,9

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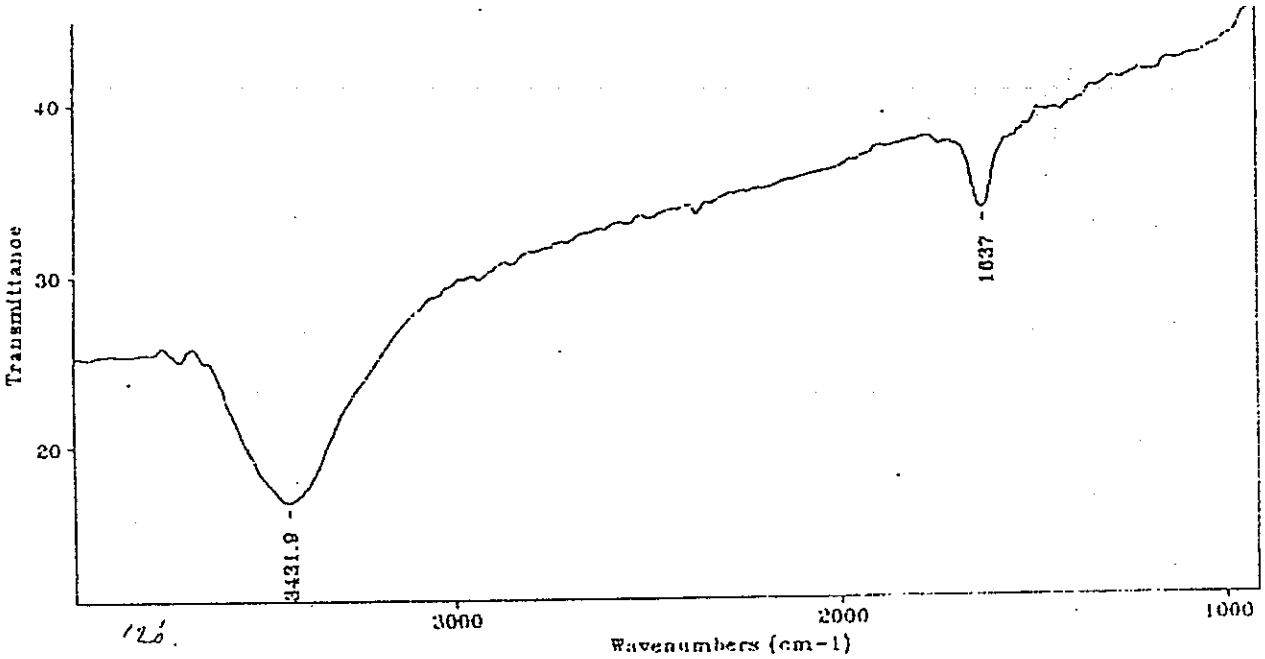
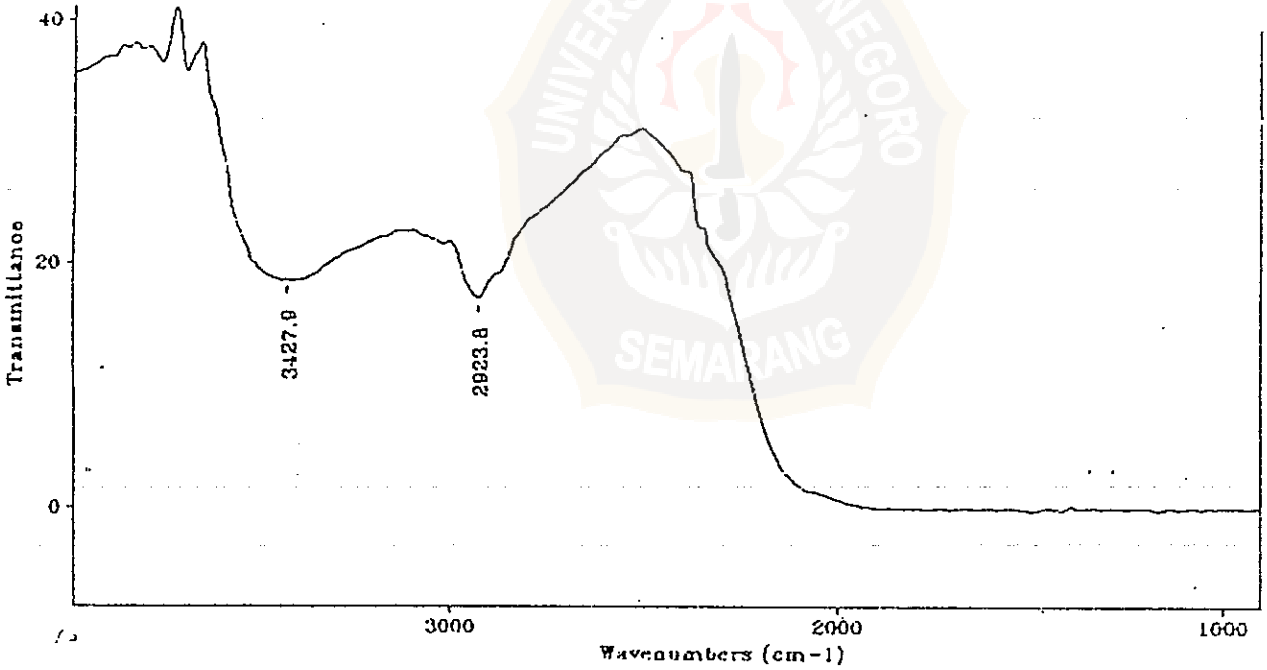
LAMPIRAN 4: Spektrum Toluene dari Spektroskopi Inframerah



Gambar: Grafik spektrum Toluene dari spektroskopi infra merah dengan teknik merusak



Gambar: Grafik spektrum Toluene dari spektroskopi infra merah dengan teknik tidak merusak

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LAMPIRAN 5: Photo bagian-bagian Sistem Deposisi Berkas Ion Plasma

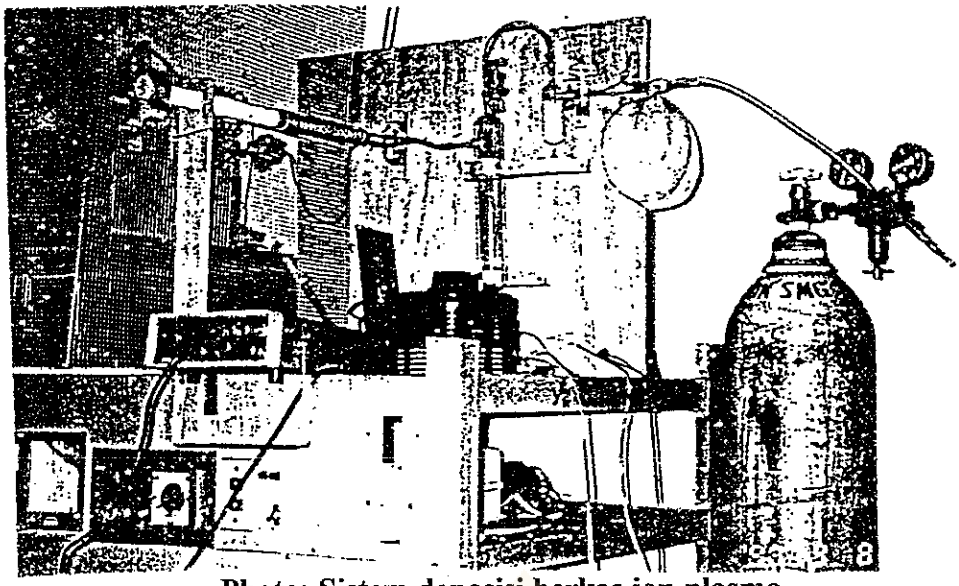

Photo: Sistem deposisi berkas ion plasma

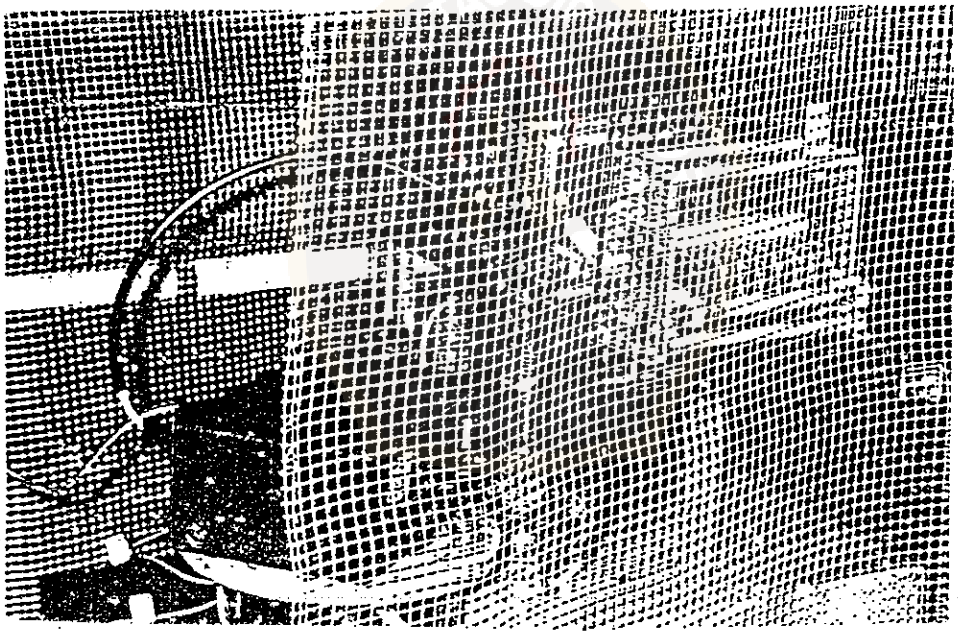

Photo: Bagian dalam Sistem RF(Radio Frekuensi)

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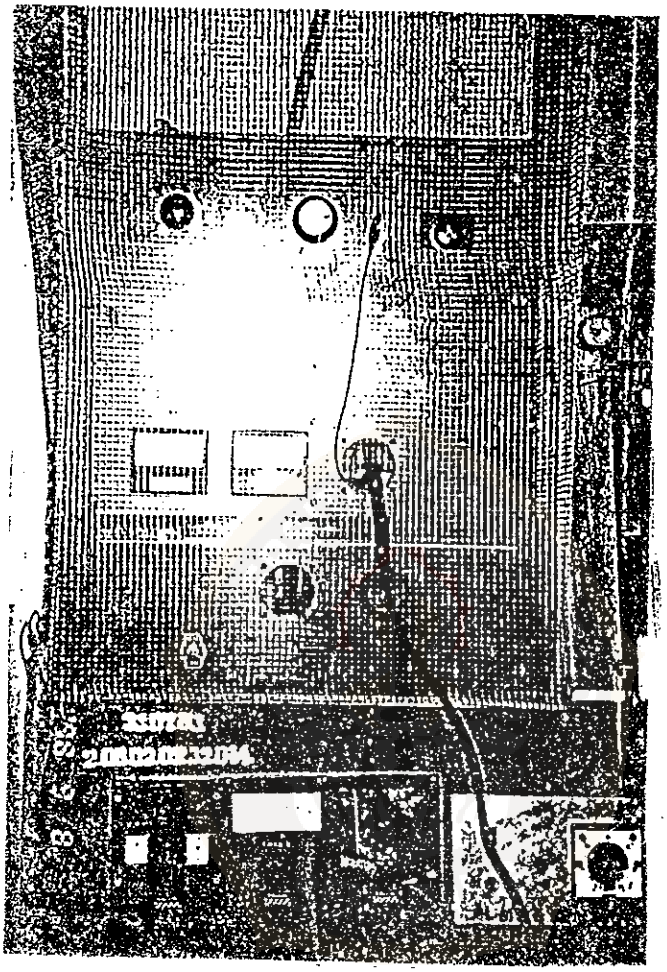

Photo: Panel muka sistem RF

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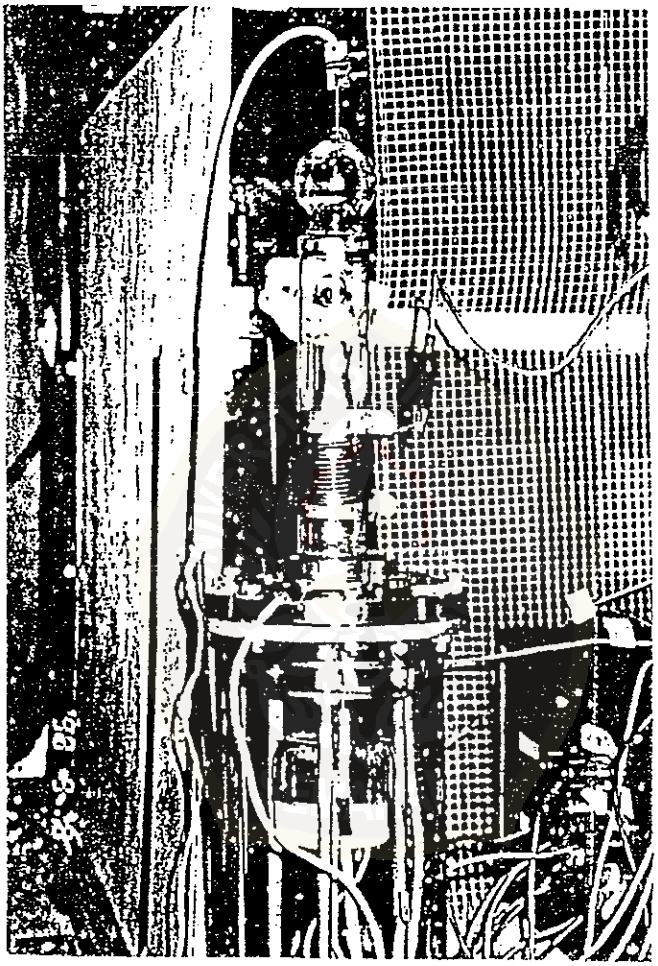

Photo: Tabung reaktor plasma

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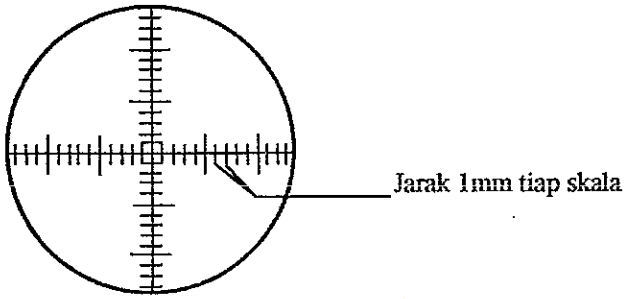
LAMPIRAN 6: Kalibrasi Pengukuran Ketebalan Lapisan Tipis Bahan Organik Terpolimer

Skala pada mikroskop Axiolab menunjukkan 1mm tiap satu skala dengan perbesaran satu kali dan jika digambarkan seperti dibawah ini:



Jarak 1mm tiap skala artinya: jika obyek yang akan diukur ketebalannya terlihat 3 skala maka tebal obyek yang sebenarnya 3x1mm = 3mm. Jika diinginkan perbesaran Xkali, maka tiap skala akan mewakili $\frac{1mm}{X} = \frac{1}{X}mm$

Pada pengukuran ketebalan lapisan tipis toluene perbesaran yang diberikan adalah 500 kali sehingga tiap skala mewakili $\frac{1}{500}mm = \frac{1000}{500}\mu m = 2\mu m$. Hasil pengukuran ketebalan lapisan tipis toluene pada perangkat dioda L-Or-S yang dibuat dengan mengambil 5 titik adalah sebagai berikut:

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Sampel	Ketebalan dalam Skala	Ketebalan dalam μm
1	2, 3, 4, 2, 3	4, 6, 8, 4, 6.
2	3, 4, 3, 4, 4.	6, 8, 6, 8, 8.
3	5, 7, 8, 7, 8.	10, 14, 16, 14, 16.
4	8, 9, 10, 10, 11.	16, 18, 20, 20, 22.

- Hitungan ralat
- Sampel 1

$$\bar{n} = \frac{(4+6+8+4+6)\mu m}{5} = 5{,}6\mu m$$

$$\Sigma(n-\bar{n})^2 = \left((-1{,}6)^2 + (0{,}4)^2 + (2{,}4)^2 + (-1{,}6)^2 + (0{,}4)^2\right)$$

$$= (2{,}56 + 0{,}16 + 5{,}76 + 2{,}56 + 0{,}16)$$

$$= 11{,}2$$

$$\bar{S}_n = \sqrt{\frac{\Sigma(n-\bar{n})^2}{n(n-1)}}$$

$$= \sqrt{\frac{11{,}2}{5(4-1)}}$$

$$= \sqrt{0{,}56}$$

$$= 0{,}75\ \mu m$$

Jadi ketebalan lapisan tipis bahan organik toluene untuk sampel 1 adalah: $(5{,}6 \pm 0{,}75)\mu m$.

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Demikian juga perhitungan ralat untuk sampel 2,3 dan 4 sama caranya seperti sampel satu sehingga didapatkan ketebalannya:

- Sampel 2

Tebal lapisan tipis bahan organik toluene untuk sampel 2 adalah:

$$\bar{n} \pm \bar{S}_n = (7{,}2 \pm 0{,}48)\mu m$$

- Sampel 3

Tebal lapisan tipis bahan organik toluene untuk sampel 3 adalah:

$$\bar{n} \pm \bar{S}_n = (14{,}00 \pm 1{,}10)\mu m$$

- Sampel 4

Tebal lapisan tipis bahan organik toluene untuk sampel 4 adalah:

$$\bar{n} \pm \bar{S}_n = (19{,}20 \pm 1{,}02)\mu m$$

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LAMPIRAN 7: Photo Perangkat Dioda L-Or-S

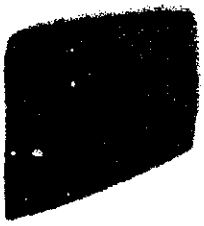

Photo: Bahan semikonduktor tipe-n

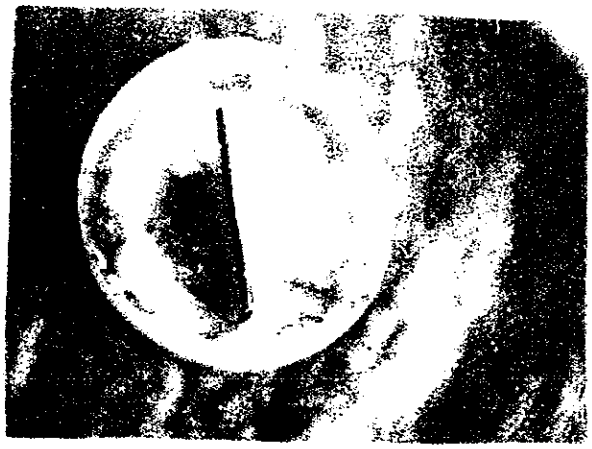

Photo: Dioda L-Or-S yang akan diukur ketebalan lapisan tipis Toluenenya

Photo: Perangkat dioda L-Or-S

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