

TABLE - 1

α -Oximino acetoacet (aryl) amides

(A denotes α -oximino acetoacet-)

No. Substance	Formula	Colour	% N		M.P. obs.	M.P. (literature)	Reference
			found	calc.			
1. A-anilide	$C_{10}H_{10}N_2O_3$	Yellow	-	-	99-100°	99-100°	173;174.
2. A-o-toluidide	$C_{11}H_{12}N_2O_3$	"	-	-	130°	130°	174.
3. A-o-chloranilide	$C_{10}H_9N_2O_3Cl$	"	11.50%	11.64%	122°	-	-
4. A-o-anisidide	$C_{11}H_{12}N_2O_4$	"	11.96%	11.86%	131-2°	-	-
5. A-p-chloranilide	$C_{10}H_9N_2O_3Cl$	White	11.63%	11.64%	178°	-	-
6. A-p-phenetidide	$C_{12}H_{14}N_2O_4$	Yellow	11.78%	11.19%	116-7°	-	-
7. A-2:4-xylylidide	$C_{12}H_{14}N_2O_3$	"	12.23%	11.96%	136°	-	-

TABLE - 2

α - β -dioximino acetoacet (aryl) amides

(D denotes α - β -dioximino acetoacet-)

No.	Substance	Formula	Colour	% N		M.P.	Reference
				found	calc.		
1.	D-anilide	$C_{10}H_{11}N_3O_3$	White	-	-	192°	181.
2.	D-o-toluidide	$C_{11}H_{13}N_3O_3$	"	17.49%	17.86%	195°	-
3.	D-o-chloranilide	$C_{10}H_9ClN_3O_3$	"	16.94%	16.44%	144°	-
4.	D-o-anisidide	$C_{11}H_{13}N_3O_4$	"	16.46%	16.72%	175°	-
5.	D-p-chloranilide	$C_{10}H_9ClN_3O_3$	"	16.25%	16.44%	203-4°	-
6.	D-p-phenetidide	$C_{12}H_{15}N_3O_4$	"	16.10%	15.84%	202-3°	-
7.	D-2:4-xylidide	$C_{12}H_{15}N_3O_3$	"	17.00%	16.86%	194-5°	-

TABLE - 3

Nickel chelates of
 α - β -dioximino acetoacet (aryl) amides

No.	Substance	Colour	% Ni found	% Ni calc.	M. P. obs.
	$\text{Ni}(\text{C}_4\text{H}_7\text{N}_3\text{O}_3\text{X})_2$ where X =				
1.	C_6H_5-	Orange yellow	11.61 %	11.76 %	> 280°
2.	$o\text{-CH}_3\text{C}_6\text{H}_4-$	Orange	11.13 %	11.13 %	"
3.	$o\text{-ClC}_6\text{H}_4-$	Yellow	10.45 %	10.33 %	"
4.	$o\text{-CH}_3\text{OC}_6\text{H}_4-$	Orange red	11.02 %	10.49 %	"
5.	$p\text{-ClC}_6\text{H}_4-$	Orange	10.00 %	10.33 %	"
6.	$p\text{-C}_2\text{H}_5\text{OC}_6\text{H}_4-$	Deep red	10.23 %	9.99 %	"
7.	$2:4(\text{CH}_3)_2\text{C}_6\text{H}_3-$	Orange red	10.20 %	10.57 %	"

TABLE - 4

Copper chelates of

α - β -dioximino acetoacet (aryl) amides

No.	Substance	Colour	% Cu found	% Cu calc.	M. P.
	$\text{Cu}(\text{C}_4\text{H}_5\text{N}_3\text{O}_2\text{X})_2$				obs.
	where X =				
1.	C_6H_5-	Brown	13.06 %	12.61 %	235°
2.	$o\text{-CH}_3\text{C}_6\text{H}_4-$	"	11.92 %	11.94 %	250°
3.	$o\text{-ClC}_6\text{H}_4-$	"	11.34 %	11.09 %	232°
4.	$o\text{-CH}_3\text{OC}_6\text{H}_4-$	"	11.85 %	11.26 %	229-30°
5.	$p\text{-ClC}_6\text{H}_4-$	"	10.90 %	11.09 %	238-9°
6.	$p\text{-C}_2\text{H}_5\text{OC}_6\text{H}_4-$	"	11.47 %	10.73 %	221°
7.	$2:4(\text{CH}_3)_2\text{C}_6\text{H}_3-$	"	11.86 %	11.34 %	242°

TABLE - 5

Cobalt chelates of

α - β -dioximino acetoacet (aryl) amides

No.	Substance $\text{Co}(\text{C}_4\text{H}_5\text{N}_3\text{O}_3\text{X})_2$	Colour	% Co		% N		M.P.
			found	calc.	found	calc.	
1.	C_6H_5-	Chocolate	11.29 %	11.01 %	-	-	> 280°
2.	$o\text{-CH}_3\text{C}_6\text{H}_4-$	"	9.63 %	10.46 %	15.08 %	14.92 %	"
3.	$o\text{-ClC}_6\text{H}_4-$	"	9.87 %	9.76 %	14.06 %	13.91 %	"
4.	$p\text{-C}_2\text{H}_5\text{OC}_6\text{H}_4-$	"	9.28 %	9.55 %	-	-	"
5.	$2:4(\text{CH}_3)_2\text{C}_6\text{H}_3-$	"	10.26 %	9.96 %	14.60 %	14.21 %	"

where X =

TABLE - 6

Palladium chelates of
 α - β -dioximino acetoacet (aryl) amides

No.	Substance $\text{Pd}(\text{C}_4\text{H}_7\text{N}_3\text{O}_3\text{X})_2$ where X =	Colour	% Pd		M.P.
			found	calc.	
1.	C_6H_5	Yellow	19.55 %	19.50 %	>280°
2.	<i>o</i> - $\text{CH}_3\text{C}_6\text{H}_4$ -	"	18.40 %	18.55 %	"
3.	<i>o</i> - ClC_6H_4 -	"	16.27 %	17.32 %	"
4.	<i>p</i> - $\text{C}_2\text{H}_5\text{OC}_6\text{H}_4$ -	Red	17.01 %	16.80 %	"
5.	2:4(CH_3) $_2\text{C}_6\text{H}_3$ -	Orange red	18.23 %	17.69 %	"

TABLE - 7

Ultraviolet absorption spectra of the Monoximes

(Aqueous solutions)

λ ($m\mu$)	log ₁₀ E _m of α -oximino acetoacet (aryl) amides				
	aryl amide	anilide	o-toluidide	o-chlor- anilide	o-ani- sidide
(1)	(2)	(3)	(4)	(5)	(6)
360	2.4715	2.3727	-	-	2.3334
356	2.4995	2.3870	-	-	2.3519
352	2.4995	2.4141	-	-	2.3696
348	2.5507	2.4397	-	-	2.3867
344	2.6176	2.4754	-	-	2.4341
340	2.6671	2.5188	-	-	2.4768
336	2.7268	2.5677	-	-	2.5032
332	2.7868	2.6116	-	-	2.5280
328	2.8752	2.6880	-	-	2.5628
324	2.9766	2.7529	-	-	2.6249
320	3.0878	2.8199	-	-	2.6707
316	3.2039	2.8868	-	-	2.7351
312	3.3288	2.9748	-	-	2.8168
308	3.4538	3.0717	-	-	2.8855
304	3.5742	3.1628	-	-	2.9494
300	3.6863	3.2380	-	3.6989	3.0324
298	3.7363	3.2935	-	3.7504	3.0616
296	3.7825	3.3396	-	3.8126	3.0956
294	3.8243	3.3770	--	3.8381	3.1301

(1)	(2)	(3)	(4)	(5)	(6)
292	3.8589	3.4175	3.8555	3.8739	3.1592
290	3.8887	3.4397	3.8810	3.9275	3.1812
288	3.9145	3.4661	3.9024	3.9473	3.2021
286	3.9309	3.4867	3.9229	3.9662	3.2270
285	-	-	-	3.9843	-
284	3.9467	3.5084	3.9352	3.9930	3.2389
282	3.9544	3.5240	3.9400	3.9930	3.2550
281	3.9563	-	3.9424	3.9843	-
280	3.9563	3.5361	3.9424	3.9753	3.2640
279	3.9534	-	-	-	-
278	3.9525	3.5488	3.9400	3.9662	3.2727
276	3.9467	3.5584	3.9388	3.9568	3.2792
274	3.9428	3.5677	3.9376	3.9375	3.2835
272	3.9369	3.5768	3.9352	3.9275	3.2835
270	3.9329	3.5858	3.9327	3.9173	3.2856
268	3.9309	3.5893	3.9340	3.8961	3.2877
266	3.9369	3.5946	3.9400	3.9173	3.2939
264	3.9447	3.6032	3.9495	3.9275	3.3041
262	3.9563	3.6182	3.9622	3.9568	3.3141
260	3.9748	3.6240	3.9790	4.0016	3.3296
258	3.9961	3.6530	3.9983	4.0499	3.3519
256	4.0197	3.6824	4.0228	4.0794	3.3731
254	4.0451	3.7184	4.0459	4.1070	3.4110
252	4.0677	3.7648	4.0733	4.1514	3.4488

(1)	(2)	(3)	(4)	(5)	(6)
250	4.0992	3.8084	4.1039	4.2026	3.4862
248	4.1096	3.8594	4.1310	4.2336	3.5340
246	4.1292	3.9055	4.1565	4.2718	3.5792
244	4.1430	3.9563	4.1779	4.2941	3.6152
242	4.1515	4.0001	4.1995	4.3194	3.6601
240	4.1599	4.0417	4.2164	4.3394	3.6960
239	4.1635	-	-	-	-
238	4.1635	4.0788	4.2313	4.3471	3.7451
237	4.1635	-	-	-	-
236	4.1599	4.1092	4.2422	4.3623	3.7606
235	-	-	-	4.3733	-
234	4.1515	4.1336	4.2494	4.3733	3.7813
233	-	-	4.2505	4.3733	-
232	4.1493	4.1509	4.2505	4.3660	3.8010
231	-	-	4.2505	-	-
230	4.1202	4.1628	4.2470	4.3804	3.8168
228	4.0920	4.1721	4.2398	4.3875	3.8230
227	-	4.1744	-	-	-
226	4.0558	4.1744	4.2289	4.3944	3.8290
224	4.0131	4.1744	4.2287	4.4180	3.8350
223	-	4.1721	-	-	-
222	3.9656	4.1721	4.2313	4.4276	3.8409
220	3.9309	4.1721	4.2517	-	-

TABLE - 8

Ultraviolet absorption spectra of the Monoximes
(Alcoholic solutions)

λ ($m\mu$)	$\log_{10} E_m$ of α -oximino acetoacet (aryl) amides			
	aryl amide : anilide	o-chlor- anilide	p-chlor- anilide	p-phenetidide
	(in rect. spirit)	(in methyl alcohol)	(in methyl alcohol)	(in methyl alcohol)
(1)	(2)	(3)	(4)	(5)
360	-	2.6751	2.6187	-
356	-	2.7378	2.6300	-
352	-	2.8048	2.6517	-
348	-	2.8628	2.7017	-
344	-	2.9235	2.7465	-
340	-	2.9850	2.7871	-
336	-	3.0389	2.8382	-
332	-	3.0868	2.8962	-
328	-	3.1415	2.9470	-
324	-	3.1798	3.0166	-
320	-	3.2338	3.0763	-
316	-	3.2777	3.1358	-
312	-	3.3252	3.2150	-
308	-	3.3679	3.2819	-
304	-	3.4130	3.3421	-
300	-	3.4595	3.4100	3.5193
298	3.2746	3.4834	3.4471	3.5488

(1)	(2)	(3)	(4)	(5)
296	3.2971	3.5062	3.4861	3.5743
294	3.3227	3.5279	3.5303	3.6138
292	3.3429	3.5463	3.5742	3.6413
290	3.3697	3.5682	3.6129	3.6753
288	3.3949	3.5870	3.6464	3.6993
286	3.4254	3.6171	3.6724	3.7219
284	3.4568	3.6224	3.7017	3.7463
282	3.4946	3.6409	3.7335	3.7706
280	3.5268	3.6569	3.7632	3.8084
278	3.5495	3.6706	3.7871	3.8432
276	3.5803	3.6856	3.8171	3.8733
274	3.6237	3.7000	3.8518	3.9053
272	3.6459	3.7140	3.8840	3.9493
270	3.6781	3.7290	3.9282	3.9845
268	3.7296	3.7564	3.9834	4.0244
266	3.7548	3.7672	4.0301	4.0650
264	3.8026	3.7947	4.0825	4.1094
262	3.8493	3.8242	4.1362	4.1442
260	3.9071	3.8606	4.1877	4.1712
258	3.9605	3.8982	4.2199	4.1886
256	4.0192	3.9401	4.2558	4.2234
254	4.0738	3.9833	4.2687	4.2344
252	4.1157	4.0241	4.2903	4.2477

(1)	(2)	(3)	(4)	(5)
250	4.1576	4.0614	4.3086	-
248	4.1936	4.0983	4.3222	4.2521
246	4.2216	4.1299	4.3267	4.2585
245	-	-	-	4.2607
244	4.2450	4.1583	4.3267	4.2628
242	4.2624	4.1839	4.3267	4.2628
241	-	-	-	4.2628
240	4.2737	4.2032	4.3222	4.2585
239	4.2756	-	-	-
238	4.2774	4.2169	4.3131	4.2542
236	4.2774	4.2282	4.2953	4.2433
235	4.2746	-	-	-
234	4.2737	4.2357	-	4.2389
233	-	4.2375	-	-
232	4.2643	4.2375	-	4.2344
231	-	4.2375	-	-
230	4.2480	4.2357	-	4.2252
228	4.2268	4.2329	-	4.2063
226	4.1980	4.2245	-	4.1916
224	4.1672	4.2197	-	4.1659
222	4.1327	4.2197	-	4.1497

TABLE - 9

Visible absorption spectra of the Monoximes

A : Methanolic solutions

λ	E_m of α -oximino acetoacet (aryl) amides		
($m\mu$)	aryl amide	o-anisidide	p-phenetidide 2:4-xylidide
(1)	(2)	(3)	(4)
650	0.0305	0.0570	-
640	0.0610	0.1140	-
630	0.0915	0.1710	-
620	0.1220	0.2280	-
610	0.1220	0.2850	-
600	0.1220	0.3420	-
590	0.1220	0.3989	-
580	0.1220	0.3989	-
570	0.1525	0.4559	-
560	0.1525	0.4559	-
550	0.1525	0.5128	0.0203
540	0.1525	0.5700	0.0203
530	0.1525	0.6269	0.0407
520	0.1525	0.6269	0.0407
510	0.1525	0.6839	0.0610
500	0.1525	0.7978	0.1220
495	-	-	-
490	0.2124	1.083	0.2237
485	-	-	-

(1)	(2)	(3)	(4)
480	0.2744	1.425	0.3457
475	-	1.691	0.4270
470	0.4574	1.937	0.5037
465	-	2.566	0.6102
460	1.220	3.191	0.7932
455	-	3.932	1.058
450	2.744	4.958	1.261
445	-	6.269	1.668
440	6.100	8.264	2.440
435	-	10.55	3.172
430	12.47	12.82	4.170
425	-	16.53	5.573
420	24.09	20.51	7.220
415	-	25.36	9.193
410	-	30.78	12.00
405	-	38.19	15.46
400	-	46.16	19.12

B : Solutions in sodium hydroxide

λ	E_m of α -oximino acetoacet (aryl) amides		
($m\mu$)	aryl amide : o-anisidide	p-chlor-anilide	p-phenetidide
(1)	(2)	(3)	(4)
650	-	-	0.4988
640	-	-	0.7481
630	-	-	0.7481

(1)	(2)	(3)	(4)
620	-	-	0.7481
610	-	-	0.7481
600	-	-	0.7481
595	-	-	0.9978
590	-	-	0.9978
585	-	-	0.9978
580	-	-	0.9978
575	-	-	1.247
570	-	-	1.247
565	-	-	1.247
560	-	-	1.247
555	-	-	1.497
550	-	-	1.497
545	-	-	1.497
540	-	-	1.746
535	-	-	1.746
530	-	-	1.995
525	-	-	1.995
520	1.184	0.7204	2.047
515	1.184	0.7204	2.494
510	1.422	0.7204	2.743
505	1.422	0.9605	3.242
500	1.895	0.9605	3.741
496	2.369	1.201	4.239

(1)	(2)	(3)	(4)
492	3.080	1.441	4.739
488	3.791	2.401	5.359
484	4.738	3.121	6.235
480	5.923	3.602	7.234
476	7.345	5.042	8.730
472	9.240	6.002	9.978
468	11.61	8.164	11.97
464	14.22	9.605	13.97
460	17.06	11.77	16.46
456	20.37	14.64	20.20
452	23.93	17.05	23.20
448	27.48	20.41	26.69
444	31.74	23.77	31 .17
440	36.01	27.63	36.92
436	40.51	31.46	43.39
432	45.73	35.30	49.63
428	49.99	39.62	56.11
424	55.44	43.94	62.85
420	60.17	48.27	69.84
416	65.39	52.35	77.32
412	70.60	55.70	83.04
408	76.06	58.83	89.05
404	81.26	60.99	93.53
400	86.72	63.39	98.53

TABLE - 10

Ultraviolet absorption spectra of the Monoximes

(Chloroform solutions)

λ (m μ)	log ₁₀ E _m of α -oximino acetoacet(aryl)amides				
	aryl amide	o-toluidide	o-chloranilide	o-anisidide	p-phene- tidide
(1)	(2)	(3)	(4)	(5)	
360	3.3903	3.3491	3.5952	3.6670	
356	3.4330	3.4142	3.6286	3.6834	
352	3.4719	3.4682	3.6459	3.6992	
348	3.5077	3.5208	3.6685	3.7084	
344	3.5364	3.5656	3.6872	3.7144	
340	3.5674	3.6081	3.6990	3.7204	
338	-	-	-	3.7233	
336	3.5981	3.6451	3.7078	3.7233	
334	-	-	3.7104	3.7233	
332	3.6234	3.6885	3.7104	3.7219	
328	3.6455	3.7209	3.7104	3.7159	
326	-	-	3.7091	-	
324	3.6651	3.7524	3.7058	3.7053	
320	3.6791	3.7793	3.6955	3.6914	
316	3.6913	3.7975	3.6815	3.6687	
312	3.6987	3.8104	3.6596	3.6482	

(1)	(2)	(3)	(4)	(5)
310	3.7017	3.8138	-	-
308	3.7017	3.8173	3.6350	3.6212
306	3.7017	3.8173	-	-
304	3.6987	3.8150	3.6038	3.6185
302	-	-	-	3.6304
301	-	-	-	3.6394
300	3.6958	3.8081	3.5774	3.6394
298	3.6913	3.8022	3.5738	3.6394
297	-	-	-	3.6340
296	3.6868	3.7939	3.5720	3.6322
294	3.6822	3.7854	3.5774	3.6340
292	3.6761	3.7755	3.5774	3.6456
290	3.6698	3.7641	3.5774	3.6569
288	3.6619	3.7537	3.5756	3.6670
286	3.6538	3.7403	3.5810	3.6753
284	3.6505	3.7266	3.5969	3.6874
282	3.6472	3.7123	3.6246	3.7069
280	3.6439	3.6961	3.6521	3.7292
278	3.6489	3.6824	3.6886	3.7512
276	3.6554	3.6730	3.7350	3.7898
274	3.6714	3.6698	3.7827	3.8289

(1)	(2)	(3)	(4)	(5)
272	3.6987	3.6792	3.8307	3.8675
270	3.7340	3.7021	3.8739	3.9171
268	3.7779	3.7417	3.9116	3.9596
266	3.8288	3.7939	3.9434	4.0060
264	3.8802	3.8522	3.9717	4.0496
262	3.9253	3.9091	3.9938	4.0877
260	3.9701	3.9660	4.0151	4.1242
258	4.0142	4.0291	4.0329	4.1551
256	4.0517	4.0677	4.0500	4.1763
254	4.0862	4.1103	4.0700	4.1940

TABLE - 11

Ultraviolet absorption spectra of Dioximes
(Aqueous solutions)

λ (μ)	$\log E_m$ of α - β -dioximino acetoacet (aryl)amides			
	aryl amide: 2:4 xylidide	p-phenetidide	p-chlor-anilide	o-anisidide
(1)	(2)	(3)	(4)	(5)
360	2.6729	2.9919	2.7718	2.8191
356	2.6855	3.0258	2.7947	2.8491
352	2.6855	3.0469	2.8164	2.8771
348	2.6977	3.0672	2.8371	2.9119
344	2.6977	3.0865	2.8664	2.9668
340	2.7212	3.1139	2.8848	2.9952
336	2.7849	3.1397	2.9026	3.0347
332	2.8042	3.1561	2.9279	3.0767
328	2.8226	3.1719	2.9670	3.1253
324	2.8818	3.2019	2.9960	3.1736
320	2.8818	3.2366	3.0297	3.2171
316	2.8818	3.2693	3.0669	3.2604
312	2.8818	3.3213	3.1012	3.3132
308	2.8818	3.3632	3.1431	3.3720
304	2.9543	3.4193	3.1813	3.4512
300	2.9987	3.4956	3.2330	3.5576
298	3.0106	3.5376	3.2567	3.6191
296	3.0445	3.5729	3.2935	3.6730

(1)	(2)	(3)	(4)	(5)
294	3.0657	3.6112	3.3307	3.7274
292	3.0956	3.6438	3.3709	3.7617
290	3.1191	3.6790	3.4131	3.7870
288	3.1626	3.7160	3.4661	3.8191
286	3.2059	3.7480	3.5046	3.8344
284	3.2553	3.7835	3.5460	3.8491
282	3.2717	3.8129	3.5945	3.8568
280	3.2998	3.8420	3.6398	3.8568
278	3.3718	3.8677	3.6822	3.8539
276	3.4202	3.8994	3.7286	3.8491
274	3.4799	3.9288	3.7718	3.8443
272	3.5031	3.9603	3.8164	3.8394
270	3.5393	3.9931	3.8616	3.8443
268	3.6038	4.0258	3.9060	3.8612
266	3.6328	4.0551	3.9533	3.8934
264	3.6830	4.0846	3.9960	3.9283
262	3.7096	4.1103	4.0310	3.9601
260	3.7626	4.1397	4.0669	3.9929
258	3.8116	4.1672	4.1023	4.0275
256	3.8574	4.1871	4.1330	4.0653
254	3.8957	4.2090	4.1559	4.1039
252	3.9421	4.2299	4.1813	4.1406
250	3.9927	4.2498	4.1992	4.1827
248	4.0279	4.2625	4.2164	4.2171

(1)	(2)	(3)	(4)	(5)
246	4.0759	4.2810	4.2297	4.2470
244	4.1237	4.2941	4.2418	4.2751
242	4.1542	4.3091	4.2508	4.2963
240	4.1925	4.3158	4.2547	4.3165
239	-	-	4.2575	-
238	4.2133	4.3241	4.2575	4.3326
237	-	4.3268	4.2559	-
236	4.2400	4.3290	4.2547	4.3435
234	4.2520	4.3290	4.2477	4.3512
233	-	4.3268	-	-
232	4.2636	4.3268	4.2390	4.3558
231	4.2701	-	-	-
230	4.2701	4.3213	4.2276	4.3588
228	4.2701	4.3158	4.2122	4.3603
227	4.2676	-	-	-
226	4.2653	4.3057	4.1948	4.3647
224	4.2620	4.2870	4.1767	4.3706
222	4.2551	4.2750	4.1530	4.3806

λ
 $\log_{10} E_m$ of α - β -dioximino acetoacet (aryl) amides
 ($m\mu$) aryl amide : anilide o-toluidide o-chloranilide

250	4.1400	3.9751	4.0432
248	4.1747	4.0247	4.0835
246	4.2069	4.0722	4.1220
244	4.2302	4.1181	4.1574
242	4.2522	4.1583	4.1859
240	4.2711	4.1950	4.2193
238	4.2853	4.2252	4.2351
236	4.2932	4.2489	4.2516
234	4.2971	4.2658	4.2602
233	4.2971	-	4.2698
232	4.2947	4.2735	4.2710
231	4.2942	4.2746	4.2710
230	4.2903	4.2746	4.2698
229	4.2803	4.2719	4.2650
228	4.2711	4.2691	4.2590
226	4.2490	4.2523	4.2440
224	4.2245	4.2300	4.2272
222	4.1985	4.2091	4.2219
220	4.1657	4.1897	4.2286

TABLE -12

Ultraviolet absorption spectra of the Dioximes

(Alcoholic solutions)

λ (μ)	log ₁₀ E _m of α - β -dioximino acetoacet(aryl)amides			
	aryl amide: anilide (in rectified spirit)	o-anisidide (in methyl alcohol)	p-phenetidide (in methyl alcohol)	2:4-xylidide (in methyl alcohol)
(1)	(2)	(3)	(4)	(5)
360	-	2.6305	2.3880	2.4680
356	-	2.6553	2.4002	2.4810
352	-	2.6788	2.4237	2.4936
348	-	2.7222	2.4350	2.5058
344	-	2.7522	2.4460	2.5293
340	-	2.7892	2.4567	2.5516
336	-	2.8150	2.4671	2.5727
332	-	2.8472	2.4874	2.5930
328	-	2.8772	2.5341	2.6123
324	-	2.9119	2.5599	2.6307
320	-	2.9503	2.5921	2.6571
316	-	2.9911	2.6432	2.6819
312	-	3.0532	2.7072	2.7054
308	-	3.1202	2.8834	2.7488
304	-	3.2096	2.9231	2.7946
300	-	3.3494	3.0869	2.8360
298	3.4767	3.4000	3.1449	2.8686

(1)	(2)	(3)	(4)	(5)
296	3.5286	3.5383	3.1961	2.9037
294	3.5804	-	-	-
292	3.6218	3.6368	3.2504	2.9581
290	3.6686	3.7065	3.2951	3.0102
288	3.7087	3.7425	3.3422	3.0634
286	3.7510	3.7561	3.3817	3.1109
284	3.7946	3.7692	3.4179	3.1536
283	-	3.7802	-	-
282	3.8372	3.7802	3.4514	3.2096
281	-	3.7757	-	-
280	3.8732	3.7729	3.4824	3.2655
278	3.9052	3.7636	3.5260	3.3224
276	3.9398	3.7474	3.5515	3.3727
274	3.9740	3.7170	3.5921	3.4193
272	4.0077	3.7139	3.6292	2.4680
270	4.0353	3.7170	3.6732	3.5118
268	4.0647	3.7243	3.7290	3.5623
266	4.0989	3.7522	3.7661	3.6075
264	4.1306	3.7962	3.8262	3.6571
262	4.1631	3.8549	3.8733	3.7092
260	4.1945	3.9218	3.9294	3.7591
258	4.2263	3.9810	3.9494	3.8068
256	4.2583	4.0335	3.9742	3.8580

(1)	(2)	(3)	(4)	(5)
254	4.2848	4.0721	3.9992	3.9085
252	4.3118	4.1139	4.0200	3.9602
250	4.3391	4.1540	4.0356	4.0159
248	4.3595	4.1889	4.0521	4.0657
246	4.3849	4.2196	4.0666	4.1139
244	4.3975	4.2396	4.0743	4.1604
242	4.4016	4.2568	4.0819	4.1999
241	-	-	4.0857	-
240	4.4097	4.2716	4.0894	4.2328
239	4.4097	-	-	-
238	4.4137	4.2804	4.0894	4.2613
237	-	4.2851	-	-
236	4.4137	4.2865	4.0894	4.2819
235	4.4097	4.2865	4.0894	-
234	4.4016	4.2865	4.0857	4.2919
233	-	4.2851	-	-
232	4.3891	4.2837	4.0756	4.3014
230	4.3631	4.2765	4.0640	4.3074
228	4.3410	4.2699	4.0467	4.3017
226	4.3108	4.2634	4.0229	4.2919
224	4.2728	4.2619	3.9968	-
222	4.2348	4.2693	3.9694	-

TABLE - 13

Ultraviolet absorption spectra of the Dioximes
(Chloroform solutions)

λ ($m\mu$)	$\log_{10} E_m$ of α - β -dioximino acetoacet (aryl) amides				
	aryl amide: o-toluidide	o-chlor-anilide	o-anisi-dide	p-phene-tidide	2:4-xylydide
(1)	(2)	(3)	(4)	(5)	(6)
360	2.8612	2.5752	3.2548	3.3725	3.0869
356	2.9703	2.7275	3.3942	3.4356	3.1856
352	3.0780	2.8762	3.4277	3.4906	3.2630
348	3.1844	3.0224	3.5032	3.5486	3.3362
344	3.2793	3.1492	3.5684	3.5916	3.3967
340	3.3702	3.2742	3.6590	3.6308	3.4612
336	3.4507	3.3745	3.7123	3.6667	3.4936
332	3.5167	3.4673	3.7496	3.6934	3.5189
328	3.5804	3.5483	3.7840	3.7125	3.5655
324	3.6324	3.6166	3.8096	3.7271	3.6076
320	3.6788	3.6773	3.8245	3.7366	3.6398
316	3.7151	3.7361	3.8372	3.7447	3.6697
314	-	-	3.8414	3.7482	-
312	3.7538	3.7820	3.8414	3.7482	3.6945
310	-	-	3.8414	3.7482	-
308	3.7845	3.8232	3.8372	3.7447	3.7137
304	3.8085	3.8585	3.8309	3.7539	3.7292
300	3.8268	-	3.8266	3.7759	3.7441

(1)	(2)	(3)	(4)	(5)	(6)
298	3.8400	-	3.8266	3.7812	3.7508
296	3.8456	-	3.8314	3.7854	3.7585
294	3.8612	-	3.8356	3.7896	3.7678
292	3.8754	-	3.8393	3.7937	3.7769
290	3.8876	-	3.8434	3.7998	3.7877
288	3.9029	-	3.8475	3.8079	3.7999
286	3.9192	-	3.8544	3.8138	3.8117
284	3.9341	-	3.8635	3.8197	3.8265
282	3.9506	-	3.8752	3.8255	3.8439
280	3.9662	-	3.8847	3.8330	3.8591
278	3.9830	-	3.8903	3.8423	3.8739
276	3.9984	-	3.9030	3.8541	3.8881
274	4.0132	-	3.9154	3.8656	3.9053
272	4.0261	-	2.9281	3.8777	3.9166
270	4.0359	-	2.9424	3.8927	3.9345
268	4.0473	-	3.9585	3.9088	3.9470
266	4.0548	-	3.9801	3.9258	3.9590
264	4.0614	-	4.0099	3.9451	3.9708
262	4.0653	-	4.0324	3.9573	3.9822
260	4.0679	-	4.0582	3.9746	3.9933
258	4.0704	-	4.0803	3.9912	4.0042
256	4.0730	-	4.0967	4.0041	4.0200
254	4.0755	-	-	4.0197	4.0352

TABLE - 14

Magnetic measurements

Substance	$\chi_g \times 10^6$ (obs)	$\chi_m \times 10^6$ (obs)	$\chi_m', \times 10^6$ (corr)	temp. °C	$\mu_{\text{effective}}$ $= 2.838 \sqrt{\chi_m' \times T}$
Ni(C ₄ H ₅ N ₃ O ₃ R) ₂					
where R=					
C ₆ H ₅ -	-0.270	-134.7	-	31.0	diamagnetic
o-CH ₃ C ₆ H ₄ -	-0.285	-150.2	-	35.0	"
2:4(CH ₃) ₂ C ₆ H ₃ -	-0.308	-171.0	-	35.5	"
Cu(C ₄ H ₅ N ₃ O ₃ R) ₂					
where R=					
C ₆ H ₅ -	+2.32	+1169	+1365	31.5	1.83
o-CH ₃ C ₆ H ₄ -	+2.30	+1224	+1444	34.0	1.89
p-ClC ₆ H ₄ -	+2.15	+1231	+1455	35.0	1.90
Pd(C ₄ H ₅ N ₃ O ₃ R) ₂					
where R=					
C ₆ H ₅ -	-0.553	-302.5	-	32.0	diamagnetic
p-C ₂ H ₅ OC ₆ H ₄ -	-0.609	-386.7	-	35.0	"
Co(C ₄ H ₅ N ₃ O ₃ R) ₂ (H ₂ O) ₂					
where R=					
C ₆ H ₅ -	+2.34	+1211	+1408	30.1	1.85
2:4(CH ₃) ₂ C ₆ H ₃ -	+2.10	+1207	+1451	35.0	1.90

TABLE - 15Solubility of Oximes in water

(at room temperature)

(A denotes α -oximinoacetoacet-;D denotes α - β -dioximinoacetoacet-)

Substance	Solubility (mgms/100 c.c.)	Substance	Solubility (mgms/100 c.c.)
A-anilide	238.0 "	D-anilide	95.7 "
A-o-toluidide	74.2 "	D-o-toluidide	107.6 "
A-o-chloranilide	33.5 "	D-o-chloranilide	158.4 "
A-o-anisidide	14.5 "	D-o-anisidide	73.2 "
A-p-chloranilide	15.0 "	D-p-chloranilide	16.7 "
A-p-phenetidide	49.2 "	D-p-phenetidide	15.5 "
A-2:4-xylydide	13.2 "	D-2:4-xylydide	18.3 "

TABLE - 16

pH of incipient precipitation of metals

(copper, nickel) by dioximes

(D denotes α - β -dioximinoacetoacet-)

Substance	pH for Cu	pH for Ni
D-anilide	1.8	1.9
D-o-toluidide	1.0	1.3
D-o-chloranilide	0.9	1.1
D-p-phenetidide	1.0	1.1
D-2:4-xylydide	0.9	1.1

TABLE-17

pH of complete precipitation of metals
(copper, nickel and palladium) by the dioximes

(D-denotes α - β -dioximino-aceto-acet)

Substance	pH for Cu	pH for Ni	pH for Pd
D-anilide	4.4	6.2	0.1
D-o-toluidide	3.0	5.1	0.1
D-o-chloranilide	2.1	4.4	0.1
D-p-phenetidide	2.8	4.7	0.1
D-2:4-xylidide	1.3	3.2	0.1

TABLE-18

Detection of the cations by the oximes

Cations	Reagent	Reaction
(1)	(2)	(3)
Fe ⁺⁺	α -oximino aceto- acet(aryl)amide	Blue or bluish violet precipitates or colouration from neutral or slightly alkaline solution.
Cu ⁺⁺	α - β -dioximino- acetoacet(aryl)- amide	Brown precipitates from slightly acidic or alkaline solution.

(1)	(2)	(3)
Ni ⁺⁺	α-β-dioximino-acetoacet(aryl)-amide	Yellow, orange or red precipitates from neutral or slightly alkaline solution.
Co ⁺⁺	"	Chocolate brown precipitates or colouration on adding ammonium acetate to the slightly acidic solution.
Fe ⁺⁺	"	Brown black precipitates or brown colouration from slightly alkaline solution.
Pd ⁺⁺	"	Yellow or red precipitates from fairly acidic or alkaline solution.
Bi ⁺⁺⁺	"	Yellow precipitates from ammoniacal solution on heating.
(UO ₂) ⁺⁺	"	Yellow colouration from neutral or slightly alkaline solution.

TABLE - 19

Composition of the precipitated Palladium chelates

(a) Chelating agent : α - β -dioximino acetoacetanilide

Pd-chelate taken (mgms)	Pd found (mgms)	% Pd -	$\text{PdC}_{20}\text{H}_{20}\text{N}_6\text{O}_6$ requires Pd
152.08	29.12	19.15	19.50 %
76.25	14.85	19.48	"
99.25	19.40	19.55	"

(b) Chelating agent : α - β -dioximino acetoacet-o-toluidide

Pd-chelate taken (mgms)	Pd found (mgms)	% Pd -	$\text{PdC}_{22}\text{H}_{24}\text{N}_6\text{O}_6$ requires Pd
188.93	35.10	18.58	18.55 %
87.20	16.20	18.58	"
71.95	13.35	18.56	"

(c) Chelating agent : α - β -dioximino acetoacet-o-chloranilide

Pd-chelate taken (mgms)	Pd found (mgms)	% Pd -	$\text{PdC}_{20}\text{H}_{18}\text{N}_6\text{O}_6\text{Cl}_2$ requires Pd
312.85	54.35	17.37	17.32 %
121.60	20.95	17.23	"
98.70	17.10	17.32	"

TABLE - 20

Estimation of Palladium by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Pd taken (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
4.44	22.8	4.45	+ 0.01
5.87	30.1	5.87	\pm 0.00
8.62	44.4	8.66	+ 0.04
11.40	58.3	11.37	- 0.03
13.06	66.8	13.03	- 0.03
17.24	88.2	17.20	- 0.04
21.94	112.3	21.90	- 0.04
22.80	117.0	22.82	+ 0.02

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Pd taken (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
4.44	24.1	4.47	+ 0.03
8.62	46.7	8.66	+ 0.04
11.40	62.0	11.50	+ 0.10
17.24	93.4	17.33	+ 0.09
21.94	118.0	21.89	- 0.05

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Pd taken (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
8.62	49.6	8.59	- 0.03
11.40	65.9	11.41	+ 0.01
13.06	75.7	13.11	+ 0.05
17.24	100.2	17.36	+ 0.12
21.94	127.2	22.03	+ 0.09

TABLE - 21

Effect of pH on the estimation of Palladium
by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Pd taken (mgms)	pH	Pd-chelate obtained (mgms)	Pd found (mgms)
11.40	0.08	58.3	11.37
8.62	0.40	44.2	8.62
11.40	0.64	58.4	11.39
8.62	0.68	44.1	8.60
8.62	0.70	44.4	8.66
8.62	0.86	44.7	8.72
5.87	1.90	30.1	5.87
8.62	8.86	44.7	8.72

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Pd taken (mgms)	pH	Pd-chelate obtained (mgms)	Pd found (mgms)
11.40	0.12	62.0	11.50
8.62	0.40	46.7	8.66
8.62	0.60	46.7	8.66
8.62	5.42	46.5	8.63
11.40	10.00	61.2	11.35

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Pd taken (mgms)	pH	Pd-chelate obtained (mgms)	Pd found (mgms)
11.40	0.08	65.9	11.41
11.40	0.12	65.6	11.36
8.62	0.40	49.6	8.59
8.62	0.60	49.6	8.59
8.62	8.94	49.6	8.59
11.40	10.10	66.2	11.47

TABLE - 22

Effect of anions on the estimation of
Palladium by the dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Pd taken (mgms)	pH	Salt/acid added (gms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgms)
8.62	0.4-0.7	Sodium acetate ... 2	44.4	8.66	+ 0.04
8.62	"	Sodium nitrate ... 2	48.1	9.38	+ 0.78
8.62	"	Potassium Iodide.. 2	-	-	
8.62	"	Tartaric acid ... 2	43.7	8.52	- 0.10
8.62	"	Potassium cyanide 0.065	31.1	6.06	- 2.52
8.62	7.08	Sodium nitrate .. 2	45.9	8.95	+ 0.33
11.40	7.78	Potassium iodide.. 2	58.5	11.41	+ 0.01
11.40	7.38	Potassium bromide. 2	59.0	11.51	+ 0.11
11.40	3.04	Potassium phosphate 2	58.9	11.49	+ 0.09
11.40	2.40	Potassium sulphate 2	58.6	11.43	+ 0.03

(b) Reagent : α - β -dioximine acetoacet-o-toluidide

Pd taken (mgms)	pH	Salt added (gms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
8.62	0.70	Sodium acetate ... 2	46.7	8.66	+ 0.04
8.62	9.40	Sodium nitrate.... 2	49.7	9.22	+ 0.60
11.40	8.94	Potassium iodide.. 2	61.9	11.48	+ 0.08
11.40	8.28	Potassium bromide. 2	62.0	11.50	+ 0.10
11.40	2.62	Potassium sulphate. 2	61.9	11.48	+ 0.08
11.40	1.90	Sodium nitrate .. 2	66.6	12.35	+ 0.95

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Pd taken (mgms)	pH	Salt added (gms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgms)
8.62	0.7	Sodium acetate ...2	49.6	8.59	- 0.03
8.62	10.20	Sodium nitrate... 2	56.0	9.70	+ 1.08
11.40	2.40	Potassium sulphate2	66.1	11.45	+ 0.05

TABLE - 23

Effect of cations on the estimation
of Palladium by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Pd taken : 8.62 mgms

pH : 0.4-0.7

Salt added (gms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
Cadmium sulphate... 0.064	44.2	8.62	+ 0.00
Stannous chloride . 0.113	44.6	8.70	+ 0.08
Chromium chloride.. 0.134	44.9	8.75	+ 0.13
Zinc sulphate 0.072	44.9	8.75	+ 0.13
Manganese chloride 0.099	44.0	8.58	- 0.04
Cobalt chloride... 0.119	44.4	8.66	+ 0.04
Ferric chloride... 0.135	44.1	8.60	- 0.02
Antimony chloride.. 0.113	44.5	8.68	+ 0.06
Mercuric chloride.. 0.136	44.6	8.70	+ 0.08

pH : 0.4-0.7

Pd taken (mgms)	Ni added (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
5.87	6.81	30.4	5.93	+ 0.06
5.87	13.22	30.4	5.93	+ 0.06
5.87	26.44	31.5	6.14	+ 0.27
11.40	6.81	59.7	11.64	+ 0.24
11.40	13.22	60.0	11.70	+ 0.30
11.40	26.44	59.8	11.66	+ 0.26
22.80	13.22	118.0	23.01	+ 0.21

pH : 0.4-0.7

Pd taken (mgms)	Cu added (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
5.87	7.85	30.5	5.95	+ 0.08
5.87	15.25	30.8	6.01	+ 0.14
11.40	7.85	58.6	11.43	+ 0.03
11.40	15.25	60.0	11.70	+ 0.30
22.80	7.85	117.6	22.93	+ 0.13
22.80	15.25	117.4	22.89	+ 0.09

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

pH : 0.4-0.7

Pd taken (mgms)	Salt added (gms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
8.62	Stannous chloride ..	0.113	46.7	8.66 + 0.04
8.62	Mercuric chloride...	1.36	46.4	8.61 - 0.01
8.62	Zinc sulphate.....	1.43	46.4	8.61 - 0.01
8.62	Chromium chloride...	0.134	47.2	8.76 + 0.14
8.62	Antimony chloride...	0.113	46.4	8.61 - 0.01
8.62	Manganese chloride..	0.099	46.3	8.59 - 0.03
8.62	Cobalt chloride....	0.119	46.9	8.70 + 0.08
11.40	Calcium chloride...	1.10	62.0	11.50 + 0.10
11.40	Barium chloride....	1.50	61.8	11.46 + 0.06
11.40	Magnesium chloride..	0.50	62.4	11.58 + 0.18
11.40	Mercuric chloride...	0.136	61.4	11.39 - 0.01

Pd. Reagent

Pd taken (mgms)	NI added (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
5.87	6.81	31.4	5.83	-0.04
5.87	13.22	31.5	5.84	-0.03
11.40	6.81	61.6	11.43	+0.03
11.40	13.22	61.8	11.46	+0.06
22.80	6.81	126.8	23.51	+0.71
22.80	13.22	126.4	23.45	+0.61

Pd taken (mgms)	Cu added (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
5.87	7.85	31.7	5.88	+ 0.01
5.87	15.25	31.1	5.77	- 0.10
11.40	7.85	64.2	11.91	+ 0.51
11.40	15.25	63.7	11.82	+ 0.42
22.80	7.85	126.2	23.41	+ 0.61
22.80	15.25	126.9	23.54	+ 0.73

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

pH : 0.4- 0.7

Pd taken (mgms)	Salt added (gms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
(1)	(2)	(3)	(4)	(5)
8.62	Mercuric chloride ..	1.36 49.5	8.57	- 0.05
8.62	Zinc sulphate	1.43 50.1	8.68	+ 0.06
8.62	Cadmium sulphate ..	0.064 50.1	8.68	+ 0.06
8.62	Chromium chloride..	0.134 49.9	8.64	+ 0.02
8.62	Ferric chloride....	0.135 50.4	8.73	+ 0.11
8.62	Antimony chloride..	0.113 50.4	8.73	+ 0.11
8.62	Mangarese chloride..	0.099 50.6	8.76	+ 0.14
8.62	Cobalt chloride	0.119 50.0	8.66	+ 0.04
8.62	Stannous chloride..	0.113 50.4	8.73	+ 0.11

(1)	(2)	(3)	(4)	(5)
8.62	Mercuric chloride ..	0.136	50.2	8.70 + 0.08
11.40	Calcium chloride...	1.10	65.9	11.41 + 0.01
11.40	Barium chloride...	1.50	65.7	11.38 - 0.02
11.40	Magnesium chloride..	0.50	66.0	11.43 + 0.03

Pd taken (mgms)	Ni added (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgm)
5.87	6.81	34.4	5.96	+ 0.09
5.87	13.22	33.6	5.82	- 0.05
11.40	6.81	66.7	11.55	+ 0.15
11.40	13.22	66.5	11.52	+ 0.12
22.80	6.81	137.0	23.73	+ 0.93
22.80	13.22	135.4	23.45	+ 0.65

Pd taken (mgms)	Cu added (mgms)	Pd-chelate obtained (mgms)	Pd found (mgms)	error (mgms)
5.87	7.85	35.0	6.06	+ 0.19
5.87	15.25	34.3	5.94	+ 0.07
11.40	7.85	71.1	12.31	+ 0.91
11.40	15.25	72.0	12.47	+ 1.07
22.80	7.85	141.0	24.42	+ 1.62

TABLE - 24

Composition of the precipitated Copper chelate

(a) Chelating agent : α - β -dioximino acetoacetanilide				
Cu-chelate taken (mgms)	titre value (M/40 $\text{Na}_2\text{S}_2\text{O}_3$)	Cu found (mgms)	% Cu	$\text{CuC}_{20}\text{H}_{20}\text{N}_6\text{O}_6$ requires Cu
53.9	4.30 ml	6.831	12.67	12.61 %
106.4	8.45 ml	13.423	12.62	"
(b) Chelating agent : α - β -dioximino acetoacet-o-toluidide				
Cu-chelate taken (mgms)	titre value (M/40 $\text{Na}_2\text{S}_2\text{O}_3$)	Cu found (mgms)	% Cu	$\text{CuC}_{22}\text{H}_{24}\text{N}_6\text{O}_6$ requires Cu
98.65	7.40 ml	11.755	11.92	11.94 %
119.70	9.00 "	14.295	11.95	"
(c) Chelating agent : α - β -dioximino acetoacet-o-chloranilide				
Cu-chelate taken (mgms)	titre value (M/40 $\text{Na}_2\text{S}_2\text{O}_3$)	Cu found (mgms)	% Cu	$\text{CuC}_{20}\text{H}_{18}\text{N}_6\text{O}_6\text{Cl}_2$ requires Cu
75.8	5.30 ml	8.419	11.11	11.09 %
166.6	11.60 "	18.426	11.06	"

TABLE - 25

Estimation of Copper by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Cu taken (mgms)	Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	61.9	7.81	- 0.04
15.25	120.7	15.22	- 0.03
23.10	182.5	23.01	- 0.09
15.25	121.3	15.29	+ 0.04

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Cu taken (mgms)	Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	65.3	7.80	- 0.05
15.25	127.7	15.25	\pm 0.00
30.50	255.6	30.53	+ 0.03

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Cu taken (mgms)	Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	70.6	7.83	- 0.02
15.25	136.8	15.17	- 0.08
30.50	275.0	30.50	\pm 0.00
7.85	71.0	7.87	+ 0.02
15.25	137.0	15.19	- 0.06

TABLE - 26

Effect of pH on the estimation
of Copper by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Cu taken (mgms)	pH	Cu-chelate obtained (mgms)	Cu found (mgms)
7.85	2.78	44.7	5.64
7.85	3.48	57.6	7.26
15.25	3.80	117.6	14.83
15.25	4.34	120.4	15.18
15.25	4.98	121.2	15.28
15.25	5.42	120.2	15.16
7.85	6.08	61.9	7.81
7.85	8.30	61.8	7.79

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Cu taken (mgms)	pH	Cu-Chelate obtained (mgms)	Cu found (mgms)
7.85	2.40	63.7	7.61
7.85	3.02	65.3	7.80
7.85	3.54	65.5	7.82
7.85	4.92	65.6	7.83
7.85	8.54	65.6	7.83

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Cu taken (mgms)	pH	Cu-chelate obtained (mgms)	Cu found (mgms)
7.85	1.38	57.9	6.42
7.85	1.72	59.4	6.59
7.85	2.12	70.6	7.83
15.25	3.88	137.0	15.19
7.85	4.42	70.6	7.83
15.24	4.80	136.8	15.17
15.24	5.32	136.5	15.14
7.85	8.92	70.4	7.81

TABLE - 27

Effect of Anions on the estimation
of Copper by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Cu taken (mgms)	Salt added (gms)	Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	Potassium bromide .. 2	61.8	7.79	- 0.06
7.85	Sodium nitrate 2	62.0	7.82	- 0.03
7.85	Potassium sulphate.. 2	62.0	7.82	- 0.03
7.85	Potassium iodide ... 2	62.0	7.82	- 0.03

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Cu taken (mgms)	Salt added (gms)		Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	Potassium bromide.. 2		64.9	7.75	-0.10
7.85	Sodium nitrate ... 2		65.4	7.81	-0.04
7.85	Potassium sulphate..2		65.7	7.84	-0.01
7.85	Potassium iodide... 2		66.1	7.89	+0.04

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Cu taken (mgms)	Salt added (gms)		Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	Potassium bromide.. 2		70.3	7.80	-0.05
7.85	Sodium nitrate ... 2		64.3	7.13	-0.72
7.85	Potassium sulphate. 2		70.3	7.80	-0.05
7.85	Potassium iodide... 2		69.2	7.67	-0.18

TABLE - 28

Effect of cations on the estimation
of Copper by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Cu taken (mgms)	Salt added (gms)		Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
(1)	(2)		(3)	(4)	(5)
7.85	Calcium chloride .. 0.55		62.4	7.87	+0.02
7.85	Magnesium chloride..0.50		62.1	7.83	-0.02

(1)	(2)	(3)	(4)	(5)
7.85	Cadmium sulphate ..	0.032 61.8	7.79	-0.06
7.85	Zinc sulphate ...	0.036 61.4	7.74	-0.11
7.85	Barium chloride ..	0.75 62.5	7.88	+0.03
7.85	Strontium nitrate .	0.65 62.15	7.84	-0.01
7.85	Ferric chloride .. (+citric acid)	0.034 61.9	7.81	-0.04
7.85	Cadmium sulphate ..	0.32 62.0	7.82	-0.03
7.85	Zinc sulphate ...	0.36 62.0	7.82	-0.03

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Cu taken (mgms)	Salt added (gms)	Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	Calcium chloride ..	0.55 65.65	7.84	-0.01
7.85	Barium chloride ..	0.75 65.75	7.85	+0.00
7.85	Strontium nitrate..	0.65 65.95	7.88	+0.03
7.85	Magnesium chloride.	0.50 65.54	7.83	-0.02

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Cu taken (mgms)	Salt added (gms)	Cu-chelate obtained (mgms)	Cu found (mgms)	error (mgm)
7.85	Calcium chloride ..	0.55 69.5	7.71	-0.14
7.85	Barium chloride ..	0.75 70.4	7.81	-0.04
7.85	Magnesium chloride	0.50 70.0	7.76	-0.09

TABLE - 29

Composition of the precipitated

Nickel chelate

(a) Chelating agent : α - β -dioximino acetoacetanilide

Nickel chelate taken (mgms)	Ni-DMG obtained (mgms)	Ni found (mgms)	% Ni	$\text{NiC}_{20}\text{H}_{20}\text{N}_6\text{O}_6$ requires Ni
137.5	79.3	16.106	11.71	11.76 %
204.2	118.0	23.965	11.74	"

(b) Chelating agent : α - β -dioximino acetoacet-o-toluidide

Ni-chelate taken (mgms)	Ni-DMG obtained (mgms)	Ni found (mgms)	% Ni	$\text{NiC}_{22}\text{H}_{24}\text{N}_6\text{O}_6$ requires Ni
177.8	97.0	19.70	11.08	11.13 %
209.1	115.2	23.39	11.19	"

(c) Chelating agent : α - β -dioximino acetoacet-o-chloranilide

Ni-chelate taken (mgms)	Ni-DMG obtained (mgms)	Ni found (mgms)	% Ni	$\text{NiC}_{20}\text{H}_{18}\text{N}_6\text{O}_6\text{Cl}_2$ requires Ni
175.1	89.2	18.117	10.35	10.33 %
223.9	113.3	23.015	10.28	"

TABLE - 30

Estimation of Nickel by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Ni taken (mgms)	Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	57.8	6.80	-0.01
13.22	112.6	13.24	+0.02
20.03	170.9	20.10	+0.07
6.81	57.5	6.76	-0.05
13.22	112.8	13.26	+0.04
26.44	224.4	26.39	-0.05
33.64	285.2	33.54	-0.10

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Ni taken (mgms)	Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	61.0	6.79	-0.02
13.22	118.7	13.21	-0.01
6.81	61.3	6.82	+0.01
13.22	118.8	13.22	+0.00

(c) Reagent : α - β -dioximino acetoacet-o-chloroanilide

Ni taken (mgms)	Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	66.2	6.84	+0.03
13.22	128.4	13.26	+0.04
6.81	65.8	6.80	-0.01
13.22	128.3	13.25	+0.03

TABLE - 31

Effect of pH on the estimation
of Nickel by the Dioximes

(a) Reagent : α - β -dioximino-acetoacetanilide

Ni taken (mgms)	pH	Ni-chelate obtained (mgms)	Ni found (mgms)
13.22	4.06	13.0	1.53
13.22	4.44	77.2	9.08
6.81	4.70	48.7	5.73
13.22	5.02	108.4	12.75
6.81	5.42	55.5	6.53
6.81	6.22	57.7	6.79
6.81	6.94	57.8	6.80
6.81	8.58	57.9	6.81
13.22	9.62	90.5	10.64

(b) Reagent : α - β -dioximino-acetoacet-o-toluidide

M taken (mgms)	pH	M-chelate obtained (mgms)	M found (mgms)
13.22	4.22	82.3	9.16
13.22	4.46	102.0	11.35
13.22	4.60	109.2	12.15
13.22	5.06	118.7	13.21
13.22	6.98	119.2	13.27
13.22	9.10	118.8	13.22

(c) Reagent : α - β -dioximino-acetoacet-o-chloranilide

M taken (mgms)	pH	M-chelate obtained (mgms)	M found (mgms)
13.22	4.14	121.7	12.57
13.22	4.38	128.7	13.29
13.22	4.40	128.1	13.23
13.22	4.50	128.5	13.27
13.22	9.44	128.4	13.26

TABLE - 32

Effect of anions on the estimation
of Nickel by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Ni taken (mgms)	Salt added (gms)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
13.22	Sodium acetate ...	2	112.1	13.18	-0.04
6.81	Potassium sulphate	2	58.2	6.84	+0.03
6.81	Potassium bromide ..	2	57.9	6.81	+0.00
6.81	Potassium iodide ...	2	58.2	6.84	+0.03

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Ni taken (mgms)	Salt added (gms)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	Sodium acetate	2	61.2	6.81	+0.00
6.81	Potassium bromide ..	2	61.9	6.89	+0.08
6.81	Potassium iodide ...	2	62.1	6.91	+0.10
6.81	Sodium nitrate ...	2	61.7	6.87	+0.06

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Ni taken (mgms)	Salt added (gms)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	Sodium acetate ...	2	66.0	6.82	+0.01
6.81	Sodium nitrate ...	2	66.2	6.84	+0.03
6.81	Potassium iodide...	2	66.4	6.86	+0.05
6.81	Potassium sulphate..	2	66.6	6.88	+0.07

TABLE - 33

Effect of cations on the estimation
of Nickel by the Dioximes

(a) Reagent : α - β -dioximino acetoacetanilide

Ni taken (mgms)	Salt added (gms)	Ni-chelate obtained (mgms)	Ni-found (mgms)	error (mgm)	
13.22	Cadmium sulphate .	0.064	113.2	13.31	+0.09
6.81	Ferric chloride .. (+ citric acid)	0.338	57.3	6.74	-0.07
6.81	Calcium chloride	0.55	58.1	6.83	+0.02
6.81	Barium chloride	0.75	58.8	6.80	-0.01
6.81	Magnesium chloride	0.50	58.4	6.87	+0.06
6.81	Strontium nitrate	0.65	58.8	6.92	+0.11
13.22	Mercuric chloride	0.068	113.4	13.33	+0.11
6.81	Chromium chloride (+ tartaric acid)	0.033	57.8	6.80	-0.01
13.22	Zinc sulphate	0.072	111.3	13.09	-0.13
Ni taken (mgms)	Pd added (mgms)	Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)	
6.81	5.87	58.6	6.89	+0.08	
13.22	5.87	112.4	13.22	\pm 0.00	
26.44	5.87	223.2	26.25	-0.19	
6.81	11.40	56.0	6.59	-0.22	
13.22	11.40	112.5	13.23	+0.01	
26.44	11.40	225.7	26.55	+0.11	
13.22	22.80	112.5	13.23	+0.01	

(b) Reagent : α - β -dioximino acetoacet-o-toluidide

Ni taken (mgms)	Salt added (gm)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	Magnesium chloride..	0.50	61.7	6.87	+0.06
6.81	Zinc sulphate	0.143	61.6	6.86	+0.05
6.81	Mercuric chloride ..	0.136	61.2	6.81	\pm 0.00
13.22	Caesium sulphate ...	0.064	118.3	13.17	-0.05
6.81	Ferric chloride ... (+citric acid)	0.135	61.3	6.82	+0.01
6.81	Calcium chloride ...	0.55	61.4	6.83	+0.02
6.81	Strontium nitrate ..	0.65	60.7	6.76	-0.05

Ni taken (mgms)	Pd added (mgms)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	5.87		61.4	6.83	+0.02
13.22	5.87		118.5	13.19	-0.04

(c) Reagent : α - β -dioximino acetoacet-o-chloranilide

Ni taken (mgms)	Salt added (gm)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	Calcium chloride ...	0.55	65.8	6.80	-0.01
6.81	Barium chloride ...	0.75	65.5	6.77	-0.04
6.81	Strontium nitrate...	0.65	65.4	6.76	-0.05
6.81	Ferric chloride (+ tartaric acid)	0.034	66.6	6.88	+0.07
6.81	Zinc sulphate	0.036	66.3	6.85	+0.04
6.81	Cadmium sulphate ...	0.032	66.0	6.82	+0.01
6.81	Mercuric chloride ..	0.034	66.5	6.87	+0.06
6.81	Magnesium chloride ..	0.50	65.5	6.77	-0.04

Ni taken (mgms)	Pd added (mgms)		Ni-chelate obtained (mgms)	Ni found (mgms)	error (mgm)
6.81	5.87		66.6	6.88	+0.07
13.22	5.87		129.4	13.37	+0.15