

Experiment No. 15 Thinner content in oil paint

I Practical Significance

The concept of drying of paint film due to evaporation of volatile solvent and the role of volatile solvent in paint. Addition of Thinner in paint reduces the viscosity so that it can be easily applied on metallic and non metallic surface.

II Relevant Program Outcomes (POs).

PO1 Basic knowledge
PO3 Experiments and practice
PO8 Individual and team work
PO9 Communication
PO10 Life-long learning

III Relevant Course Outcomes

f) Use paint, varnishes and relevant engineering materials in industry.

IV Practical Learning Outcome:

Determine thinner content in oil paint.

V Practical Skills

Measurement skill: Weighing skill

VI Relevant Affective domain related Outcomes:

Maintain tools and equipment.

VII Minimum Theoretical Background:

Paint is applied on metallic surfaces to prevent corrosion. Addition of thinner reduces viscosity of paint. A paint thinner is a solvent used to thin oil-based paints or clean up after their use. Commercially, solvents labeled "Paint Thinner" are usually mineral spirits having a flash point at about 40 °C (104 °F), the same as some popular brands of charcoal starter.

VIII Experimental set-up

NA

IX Resources required

Sr. No.	Resources	Specifications	Quantity	Remark
1	Crucible	Silica	10	
2	Electric Oven	Electric oven inner size 18''x18''x18''; temperature range 100 to 250 ^o C. with the capacity of 40 lt.	01	
3	Chemical balance	scale range of 0.001g to 500gm pan size 100 mm; response time 3-5 sec.; power requirement 90-250 V, 10 watt	01	
4	Desiccators		10	
5	CaCO ₃	Crystals		
6	Oil Paint			

X Procedure

1. Weigh approximately 1g (W) of paint on an electronic weighing balance in a porcelain dish.
2. Keep the porcelain dish in a previously heated electric oven at 120^o c and heat for one hour.
3. Keep the crucible in desiccators to cool down to room temperature.
4. Weigh the sample accurately.
5. By knowing the loss in weight of paint, calculate the thinner content in paint.

XI Precautions

1. Handle the crucible carefully.
2. Cool the crucible in Desiccator.

XII Actual procedure followed

Weight approx 1g (w) of paint on an electronic weighing balance in a porcelain dish.

XIII Resources used (with major specifications)

Electric oven, chemical balance, Desiccators, crucible, CaCO₃, oil paint.

XIV Precautions followed

1. Handle the crucible carefully.
2. Cool the crucible in Desiccator.

XV Observations and Calculations			Value
Sr. No.	Observations	Symbol	
1	Weight of empty porcelain dish	W_1	<u>68.816</u> gm
2	Weight of porcelain dish+paint(before heating)	W_2	<u>64.580</u> gm
3	Weight of a paint(W)	$W = W_2 - W_1$	<u>1.01</u> gm
4	Weight of porcelain dish +paint (After heating)	W_3	<u>64.510</u> gm
5	Loss in weight of a paint(Z)	$Z = W_2 - W_3$	<u>0.43</u> gm

Calculations

Calculate percentage of thinner content

If (W) g of paint contain = (Z) g of thinner

$$100\text{g of paint contain} = \frac{Z \times 100}{W} \% \text{ of thinner}$$

$$100\text{gm paint contain} = \frac{0.37 \times 100}{1.01} \% \text{ of thinner}$$

$$\text{The paint contain} = \frac{36.63}{100} \% \text{ of thinner}$$

XVI Results

Thinner content of paint is 36.63 %

XVII Interpretation of results

The thinner content of paint is 36.63.

XVIII Conclusions and Recommendations (if any)

The weight of bowl contain paint is different heating bowl (low) & different before reaction.

XIX Practical Related Questions:

1. Why weight of paint decreases after heating?
2. What is the use of Desiccator?
3. Why the oven should be previously heated.
4. What is the role of CaCO_3 in desiccator?
5. At what temperature paint is heated?

XX References / Suggestions for further Reading

Sr. No.	Title of Book	Author	Publication
1	Engineering Chemistry	Jain and Jain	Dhanpat Rai and sons; New Delhi, 2015, ISBN : 9352160002
2	Engineering Chemistry	Dara, S. S.	S.Chand. Publication, New Delhi, 2013, ISBN: 8121997658
3	Fundamental of electrochemistry	Bagotsky, V.S.	Wiley International N. J., 2005, ISBN: 9780471700586
4	Experiments and calculations in engineering chemistry	Dr.S.S.Dara	S.Chand. Publication, New Delhi, 2011, ISBN: 8121908647
5	Engineering Chemistry	A.D. Sharma, V. Thakur	Wiley International N. J., 2012, ISBN: 9788126537419
6	Engineering Chemistry	Shashi Chawla	S.Chand. Publication, New Delhi, 2013, ISBN: 1234567155036

XXI Assessment Scheme

Process related assessment scheme

Sr. No.	Process related	Weightage(60%)
1	Preheating of oven.	15%
2	Weight of empty crucible.	15%
3	Weight of crucible with paint.	15%
4	Process for cooling of crucible after heating.	15%

Product related assessment scheme

Sr. No.	Product related	Weightage(40%)
1.	Percentage of thinner content in oil paint	40%

List of Student, Team Members

1.
2.
3.
4.

Marks Obtained			Dated Signature of Teacher
Process Related (15)	Product Related (10)	Total (25)	
14	09	23	<i>[Signature]</i>

[Space to Write Answers]

Q.1 _____?

After heating the paint that point evaporates so the paint decrease after heating.

Q.2 _____?

The use of desiccator is full the heated or hot bowl or cup.

Q.3 _____?

To decrease the point and maintain the temperature.

Q.4 _____?

To observe the moisture present in the air is the role of CaCO_3 desiccator.

Q.5 _____?

At 120°C temperature point is heated.