

3-Results and discussion

Obtained results for various tests carried out on the sample are tabulated below:

3.1-physical properties of the crude castor oil

Table .1

Property	Crude Castor Oil
Specific gravity	0.9587
Viscosity at 28c [st]	9.1805
Refractive Index at 28c	1.4686
PH	6.11

3.2-chemical properties of the crude castor oil:

Table.2

Property	Consumed volume	Value property
Acid value [mg KOH/1g of oil]	0.1	1.222
Saponification value [mg KOH/of oil]	3.3	185.13
Iodine value [g I ₂ /100g of oil]	13.8	87.56

3.3-Determination of percentage oil extracted:

Table.3

Determination	Value(g)
Weight of empty flask(M1)	139.89
Weight of thimble(W1)	2.27
Weight of sample +thimble(W2)	22.27
Weight of sample(W2-W1)	20
Weight of empty flask +oil(M2)	147.99
Weight of oil(M2-M1)	8.10
2- nd Weight of sample	10
3-rd Weight of sample	15
4-th Weight of sample	25

3.4-Determination of moisture content:

Table.4

Time (h)	0	2	4	6	7
Weight (g)	30.52	16.77	7.55	1.27	1.26

The percentage of oil extracted=40.5%,percentage moisture content=4.15

3.5-ASTM specification for quality castor oil:

Table.5

Property	Ranges
Specific gravity 20/25c	0.957-0.968
Refractive index, nd	1.476-1.479
Viscosity at 25c	6.3-8.8
Colour (gadner)	Not darker than 2-3
Saponification	175-187
Acid value	0.4-4.0
Iodine value	82-88

3.6-Discussion and comment:

The results obtained for the percentage moisture content,4.15% shows variation from report a moisture content of the range of 5to7percent.this different due to heated of seed to 60°C.The result obtained from the percentage oil content 40.5% fall within the range of the percentage oil content (30-55%)of castor beans depending on the variety. Though ,something close to100% yield(basing on55%oil content of the castor bean) would have expected the mode of extraction is a very important parameter affecting the yield as reported[Tropical Product Institute,1981].It is report that the best available method for extraction of castor oil at present is by the use of hydraulic pressing. [Weise E .A ,Longman ,1983].Table1 present the physical properties of crude oil obtained in this work. The specific gravity value for crude oil is obtained to be equal (0.9587) this is agreement with the standard report in literature [Lew Kowitzeh ,1909]. Difference was observed between the value of the visticosity of the crude castor oil and the result in table5 it was found to be outside the recommended standard range of 6.3-8.8st [Lew Kowitsed,1909] this may be attributed to the fat that some

impurities and other components. The refractive index is equal 1.4686. Comparing this result with the (table 5), value that range from 1.476 - 1.479. a little difference is noticed. However, this little difference can be considered being within an acceptable experimental error range that can be attributed to the presence of some impurities and the other component of the crude oil mixture.

Also, the pH value of the crude oil which was found to be 6.11 indicates that the oil is more acidic.

The chemical properties analysis shown in (table 2) indicates that the acid value of crude oil is 1.222 mg KOH /g of oil. The value is higher in crude oil due to free fatty acid present. 0.1M of KOH used in the treatment of the crude oil, which must have neutralized the free fatty acid present in it. This value falls within the range specified in {Lew Kowitzeh, 1909}. The result for the saponification value of the crude oil that was found to be 185.13 mg KOH/g of oil. The saponification value of crude oil is highly comparable with the result in (table 5). Also, the iodine value of crude oil 87.56 using Wij's solution that means the unsaturated of the crude oil would be lower compared to the result in (table 5). This oil could be classified as non-drying oil, since the iodine value is lower than 100.

Conclusion:

The percentage oil content of castor seed was found to be 40.05%. As such a satisfactory result cannot be achieved by solvent extraction (n-hexane) process using laboratory Soxhlet apparatus. The castor oil produced in this research work was analyzed for specific gravity, viscosity at 28°C, refractive index at 28°C, acid value, saponification and iodine value. Their respective values are 0.9587, 9.1805, 1.4686, 1.222, 185.13, 87.56. Most of the values comply with the standard specified by ASTM (table 5). The oil is of good quality and could be recommended suitable for industrial usage.