Impact Factor Value 4.046 **e-ISSN: 2456-3463**
National Conference on **"Emerging Trends In Engineering & Technology"**
Organized by **Manoharbhai Patel Institute Of Engineering& Technology Shahpur, Bhandara**
International Journal of Innovations in Engineering and Science, Vol. 4, No.5, 2019
www.ijies.net

"Experimental Investigation on Properties of Concrete With Sugar & Admixture"

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Abstract- The main objective of this paper release to check the properties of concrete like compressive strength ,durability, and setting time ,workability by using Sugar and admixture (retarder)using very low dosage of 0.0025,0.05,0.06,0.08 and 0.1.by weight of cement with comparison normal and retarder (PCE) with same percentage .The average compressive strength sugar concrete at 28 days as compared to normal concrete block is increase by 19.90 % .The average strength 0f normal concrete block is 16.02%. The average strength 0f retarder concrete block is 16.02%.The grade of concrete block is used M30 of ratio 1:0.75:1.5 and the size of concrete block mould is 150x150x150mm.

keywords: Setting time, Workability, consistency test Sugar ,Admixture**.**

INTRODUCTION

Concrete is a construction material made up of cement, sand, aggregate, water,, admixture. When water is added then hydration reaction carried out. In hot session water is evaporated. To delay initial setting time retarder is used in concrete. Specially summer session retarder (Sugar) are used.

Sugar is the carbohydrates a substance composed of oxygen , carbon and hydrogen a white crystalline form sucrose C22H11O6 which is easily soluble in water and easily available in market. Very small dosage of sugar 0.0025,0.05,0.06,0.08 and 0.1by weight of cement cheaply available in market.

Poly carboxylic ether (aura 300) is super plasticizer extremely high water reducer improved workability and increase compressive strength 20to 30% dependably shows good workability .

LITERATURE REVIEW

Bazid khan (2004) he added sugar as an admixture in cement paste into three different types of cement. The test result show that the effect of sugar on setting time of cement paste depend upon the dosage and different types of cement used. According to his investigation the one type of cement it accelerated the initial setting time and related the final setting time when dosage higher than 0.25% was used.

G.L. Oyekan (2007) successful worked on improving the compressive strength of concrete block by the addition of sugar. 0.1% sugar content (by weight if cement) increased the compressive strength of the blocks by nearly 17% at 28 days. At 0.2% sugar content (by weight of cement) the 28 days strength of the blocks was increased by only 9% but the 14 days strength of the blocks was increased by 56.6%.

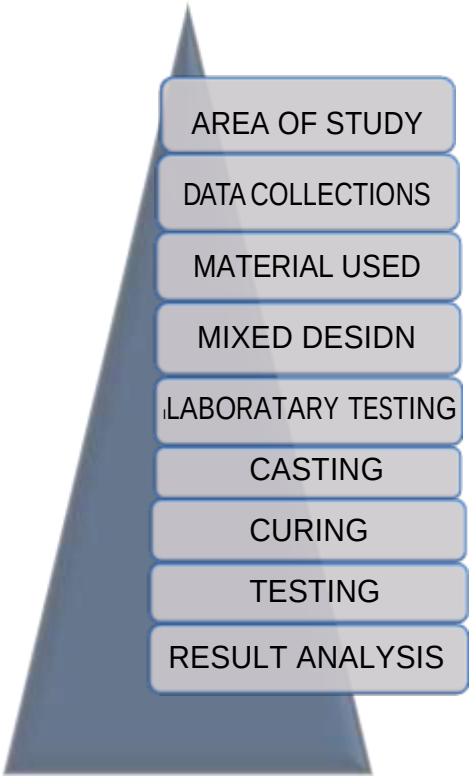
Akogu Elijah Abalaka (2011) a successful work on sugar at concentration of 0.05% by weight of sugar content were taken on the cement paste C33 concrete curing at 3,7,14 and 28 days was investigated by use of ordinary Portland cement. The compressive strength test results show some marginal strength gains at all ages but peaks at 11.84% at 3 days at 0.05% sugar content.

Giridhar.V (2013) based on the test results, as percentage of admixture increases from 0 to 0.1% the

compressive strength of concrete also increased. Maximum strength of concrete was related on workability of concrete and it can be achieved by high degree of workability. The compressive strength of concrete measured for both admixtures after 7 and 28 days. After 28 days, the percentage of variation between the ordinary concrete and concrete with 0.1% of sugar added as admixture was 12.0%.

METHODALOGY

Methodology adopted in this project are given below.



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MATERIAL USED

CEMENT: OPC 53 grade of cement conforming IS 10262 is used. The specific gravity of cement 3.15 and initiall setting time is 90 minand final setting time 280 min.

FINE AGGREGATE: Fine aggregate conforming IS383 -1970 and locally available river zone II sand is used bellow passing IS sieve 4.75 mm which fineness modulus is 2.9 which is specific gravity 2.705 .

COARSE AGGREGATE : Corse aggregate conforming IS code 383-1970 which is specific gravity 2.74. It should be hard ,durable, dense, stronge and clean.

WATER: Portable water used in concrete.

ADMIXTURE: Sugar are used as a admixture (retarder).Sucrose C22H11O6 which is white crystline form and easily soluble in water.

MIX PROPORTIONS

Mix proportion M30 Grade of concrete is ratio 1:0.75:1.5 as per IS code10262 1982 and W/C IS 0.45.For better workability, aggregate were used as 60% and 40% of 20mm ,10mm respectively and aggregate of zone II. The sugar as a admixture is added 0.0025,0.05,0.06,0.08 and 0.1 by weight of cement For every dosage workability test of fresh concrete perform and compressive test of 3 days, 7 day, 28days of 3 cubes of 3 specimen.

RESULTS AND DISCUSSION

A series of laboratory tests (initial setting time, final setting time, consistency and specific gravity) have been performed with cement by adding different percentages of sugar and admixture.

TABLE 1

Initial, final setting time and slump Results

Sr.no.	Sugar content in %	Slump	Initial setting time	final setting time
1	0.0	80	210min	630min
2	0.0025	85	280min	660min
3	0.05	95	300min	690min
4	0.06	100	330min	720min
5	0.08	110	410min	760 min
6	0.1	125	550min	60 hr

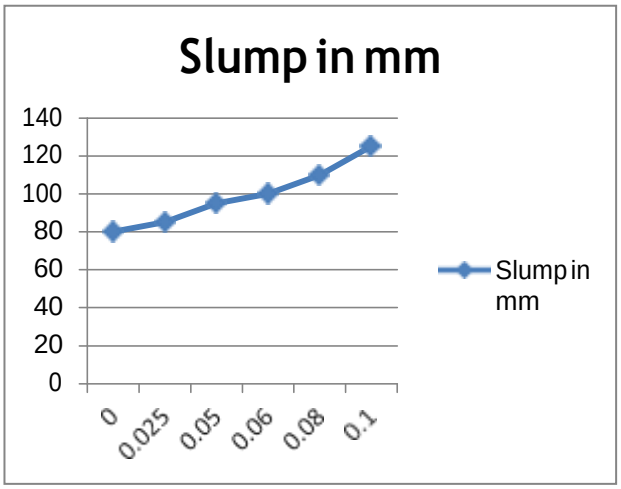

Fig . 2 Slump value of concrete added with sugar

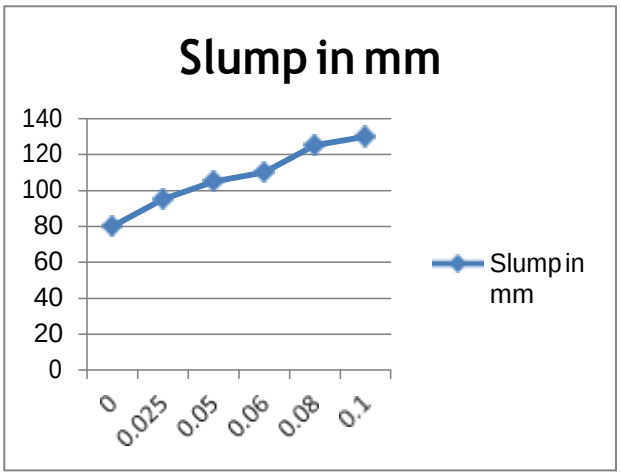

Fig.3 Slump value of concrete added with admixture (PCE)

TABLE 2

Initial, final setting time and slump Results

Sr. no.	PCE content in %	Slump	Initial setting time(min)	final setting time(min)
	0.0	80	210	630
2	0.0025	90	230	650
3	0.05	100	240	660
4	0.06	110	265	660
5	0.08	125	270	670
6	0.1	130	275	680

TABLE 3

Results of Compressive strength of days Sugar after 3days,7 days , 28 days .

Sr.no	Sugar content in %	compressive strength (SUGAR) N/mm2		
		3 days	7 days	28 days
1	0.0	12.44	32.44	42.88
2	0.025	26.44	38.88	55.77
3	0.05	19.77	37.99	48.11
4	0.06	32.88	36.44	52.22
5	0.08	31.77	37.99	60.66
6	0.1	21.11	37.11	65.60

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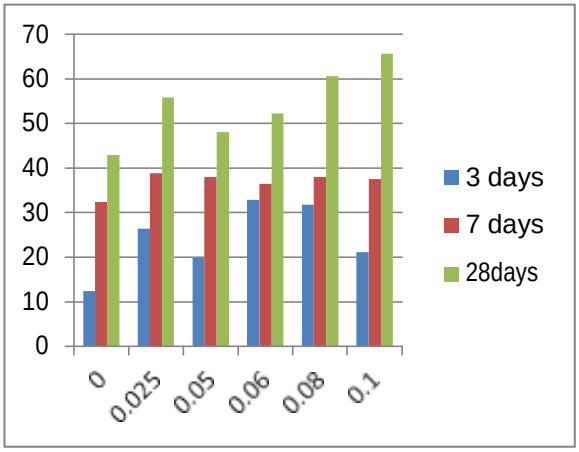

Fig 3 Compressive strength of concrete with Sugar as admixture

TABLE 3

Results of Compressive strength of days Sugar after 3days,7 days , 28 days .

	Admiture(PCE) in %	**Compressive strength (PCE) N/mm2**		
		3 days	**7 days**	**28 days**
1	0.0	12.44	32.44	42.88
2	0.025	26.22	49.77	60.11
3	0.05	33..22	50.32	65.23
4	0.06	34.52	51.52	66.60
5	0.08	36.22	53.22	69.66
6	0.1	37.44	56.33	72.11

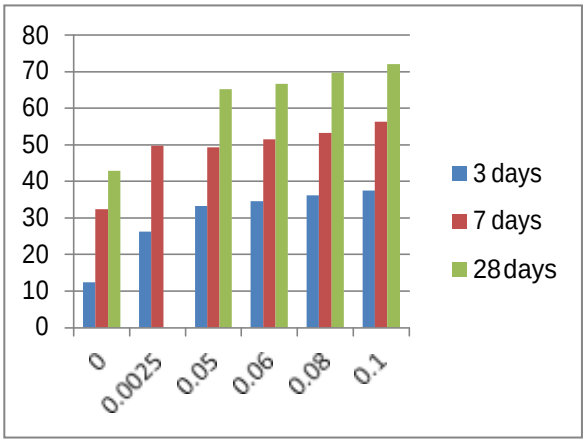

Fig 4 Compressive strength of concrete with PCE as admixture

CONCLUSION

The test carried out at 3,7 and 28 days the comparison is made between the varying proportions 0.025 ,0.05 ,0.06 ,0.08 ,0.1% of addition of sugar and admixture in concrete mix for setting time , workability and compressive strength .After completion of project , it concluded that admixture is better than sugar but sugar can use in concrete as retarder if admixture is not present on site .

ACKNOWLEDGMENT

I must offer my profound gratitude to my thesis advisor Prof. P. R. Lanjewar, Assistant Professor, Civil Engineering Department and also to staff members of Civil Engineering Laboratories for their assistance and cooperation during the course of experimentation. I would like to thank everyone for encouraging and helping to shape my interests and ideas.

REFERENCES

1) *Bazid khan (2004) he added sugar as an admixture in cement paste into three different types of cement.*
2) *G.L. Oyekan (2007) successful worked on improving the compressive strength of concrete block by the addition of sugar.*
3) *IS 12269(1999): Indian standard specification for 53 grade of ordinary Portland cement .*

4) *IS 383 (1970): Specification for coarse aggregate and fine aggregate from natural sourse of aggregate*
5) *IS 10262 (2009): Indian standard recommended guide linefor concrete mix design .*
6) *IS 456 (2000) : plain and reinforced concrete – code ofpeactice forth revision .*
7) *IS 9103 (1999) : specification for concrete admixture ..*