The Role of Oxygen Concentration of 8 and 10 Mg/L in the Main Fermentation of Beer

Brewing Science

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Abstract

Oxygen represents to us, both a friend and foe. As it is much needed especially during the fermentation process, should also be completely eliminated even his contact with the beer during transfer from one tank to another of the finished beer and during packaging in bottles, cans or barrels. It is very important to understand when he should, and vice versa. And where aeration or oxygenation process is necessary as for example during fermentation should be a wide aeration or oxygenation is allowed within certain criteria. The taste of beer stability remains a key point throughout factories producing beer. Hundreds ingredients , form a complex matrix of beer and of course chemical reactions lead to changes in the composition of the beer as well as the characteristics associated with taste and smell. Among the many ways of decomposition, in particular the quality of the beer is harmful, the volatility of iso - alpha - acids and derivatives that are used as key agents in beer distressful.

Introduction

In stage a new fermented beer, after giving oxygen in varying amounts, and it 8 and 10 mg / l. It's taken for analysis to extract beers initial 15%, 13% and 11.3%, and the comparisons with results obtained through the beer reference. As a target we had given the influence of oxygen in the fermentation of beer, to acquire a beer with flavor and aroma with good, and for a life of good beer.

Methods

Table 1. Analysis of green beer with supplying oxygen in amounts of 8 mg / l.

The basic extract	Really extract	Visible extract	The rapid rate of fermentation	The apparent rate of fermentation	alcohol	pH
%	%	%	%	%	% v/v	
15.6	5.95	3.66	63.8	76.54	6.51	4.43
14.81	5.22	2.95	66.51	80.08	6.43	4.34
11.51	3.68	1.82	69.27	84.13	5.13	4.23

Table No. 1, is presented the analysis mirrors the new brewery with award oxygen of 8 mg/l, in fermentation. And note the rapid scale and visible to fermentation in nominal value, if we refer to the guidelines of the European Convention for beer.

Table 2. Analysis of beer finished with oxygen amounts of 8 mg / l.

The basic extract	Really extract	Visible extract	The rapid rate of fermentation	The apparent rate of fermentation	alcohol	CO2	color	bitterness	O2 measured	O2 total	polyphenols	pH
%	%	%	%	%	% v/v	g/l	EBC	EBC	mg/l		mg/l	
15.6 10.82	3.64	1.93	67.61	82.16	4.69	5.3	8	22	0.14	0.3	128	4.43
14.81 11.31	3.82	2.03	67.58	82.04	4.91	5.2	8.5	22	0.09	0.18	127	4.35
11.51 11.11	3.74	1.98	67.66	82.17	4.82	4.9	8.4	21	0.13	0.27	124	4.40

In table 2, the analysis is presented for beer mirrors ready with extracts of 15%, 13% and 11.3%, the amount of oxygen sons-in fermentation of 8 mg/l. and have noticed these changes:

- The expected value to extract real and visible,
- Also, the degree of rapid and significant degree of fermentation,
- Alcohol in amounts appropriate for these values,
- Sufficient CO_2,

• Color proper,
• Good Grief
• measuring oxygen and dissolved the good, and
• polyphenols accepted.

Table 3. Analysis of green beer with supplying oxygen in amounts of 10 mg/l.

The basic extract	Really extract	Visible extract	The rapid rate of fermentation	The apparent rate of fermentation	alcohol	CO_2
%	%	%	%	%	% v/v	
15.1	5.10	3.21	67.8	78.5	6.9	4.48
13.2	4.80	2.75	69.5	81.2	6.8	4.32
11.5	3.15	1.55	72.4	85.1	5.2	4.41

The table number 3, we presented analysis of new beer by supplying to oxygen in amounts of 10 mg / l, in extracts of 15%, 13% and 11.3%. From this overview of an increasing quantity of apparent value of scale and rapid degree of fermentation.

Table 4. Analysis of beer finished with oxygen amounts of 10 mg/l.

The basic extract	Really extract	Visible extract	The rapid rate of fermentation	The apparent rate of fermentation	alcohol	CO_2	color	bitterness	O_2 measured	O_2 total	polyphenols	pH
%	%	%	%	%	% v/v	g/l	EBC	EBC	mg/l		mg/l	
15.1 11.0	3.52	1.95	68.15	83.1	4.75	5.2	7.8	22	0.18	0.29	129	4.56
13.2 10.85	3.60	1.64	69.10	82.5	5.10	5.3	7.5	21	0.20	0.30	127	4.45
11.5 10.51	3.48	1.72	71.25	83.0	4.94	5.1	8	21	0.17	0.28	122	4.36

While at table number 4 are given analysis of beer finished with oxygen amounts of 10 mg/l, in extracts of 15%, 13% and 11.3%, and in this overview we see:

• Reduction extracts real value
• Reduction of the value of extract significantly
• An increase of the value of rapid degree of fermentation
• Increasing the level of fermentation visible

While the values of alcohol, CO2, color, bitterness, and polyphenols are normal oxygen values given by the European Convention of beer.

Interpretation of Results

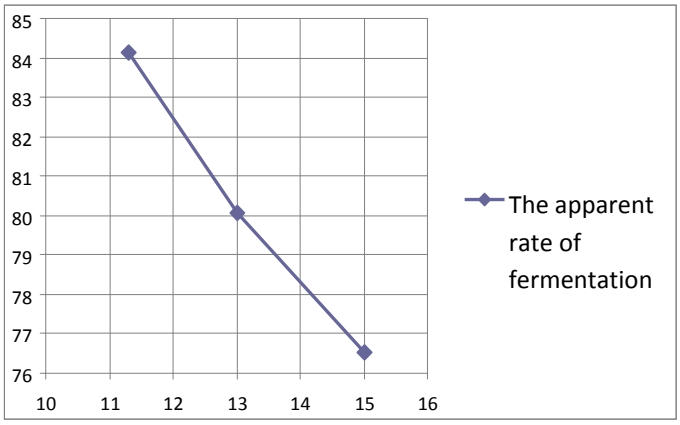

Figure 1. Apparent rate of fermentation for the new beer, amount of 8 mg/l in extracts of 15%, 13% and 11.3%.

At figure 1, the graph shows apparent degree of fermentation that the new beer with extract of 15%, 13% and 11.3% and the amount of oxygen in the fermentation of 8 mg/l.

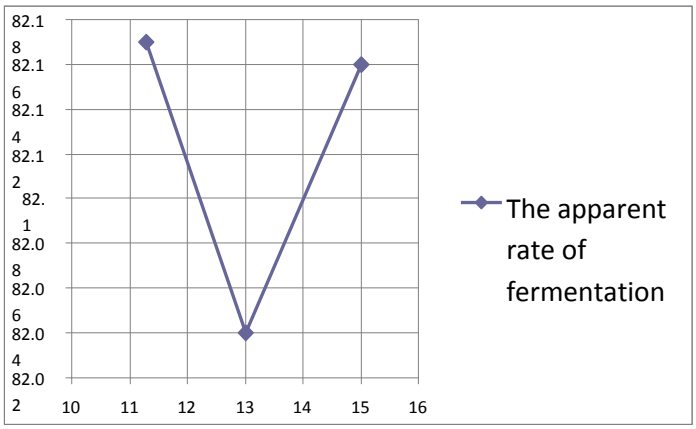

Figure 2. Apparent rate of fermentation of beer ready, equal to 8 mg / l in extracts of 15%, 13% and 11.3%.

At figure 4, the graph shows apparent instance of beer that finished with oxygen amount of 8 mg / l, in extracts of 15%, 13% and 11.3%, and noted that:

- Extract 15% has apparent scale fermentation 82.16%,
- To extract 13% have apparent scale fermentation 82.04%, and
- To extract 11.3% have apparent scale fermentation 82.17%.

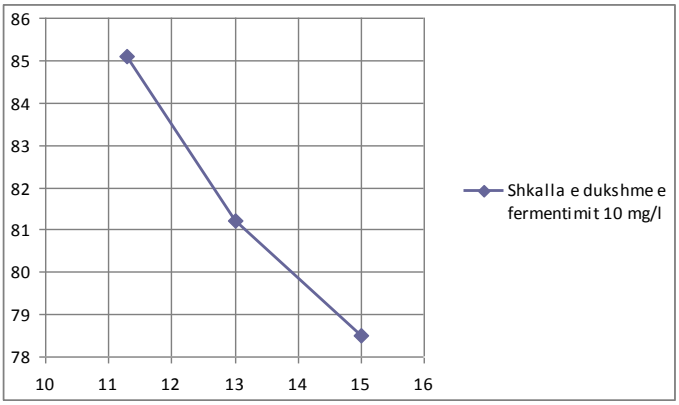

Figure 3. Apparent rate of fermentation for the new beer, amount of 10 mg/l in extracts of 15%, 13% and 11.3%.

Also in the picture number 3 is given graph degree visible for new beer fermentation, the extract of 15%, 13% and 11.3%, where the main fermentation was given oxygen in amounts of 10 mg / l.

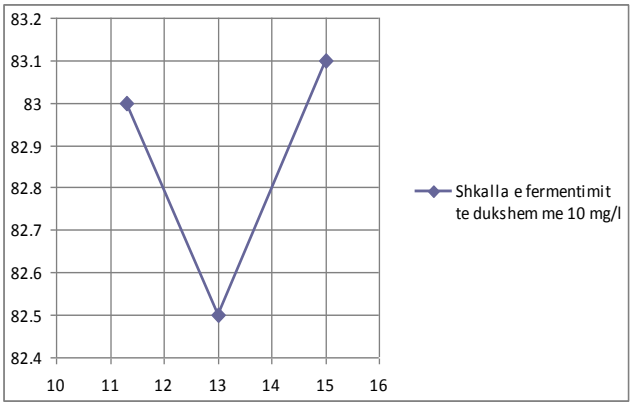

Figure 4. Apparent rate of fermentation of beer ready, equal to 10 mg/l in extracts of 15%, 13% and 11.3%.

We figure number 4, is presented graph degree visible for beer fermentation readily with oxygen amount of 10 mg/l, we extract the beer of 15%, 13% and 11.3%, and note:

- For beer with extract 15% have significant scale fermentation 83.1%
- For beer with extract 13%, fermentation apparent magnitude 82.5%, and
- For beer with extract 11.3%, have significant scale fermentation 83.0%.

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