

2011

The Chemistry Behind Beer

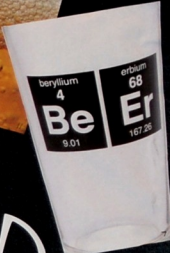
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THE CHEMISTRY BEHIND BEER



Brewing Process



Mashing & Sparging:
Crushed malts are added to hot water. Out of this, the wort (juice) wort is undenatured beer wort comes from separating the grain from the water. The mashing process is followed by sparging. This is where the sugars come from the grain to suit. This is called mashing. Heat the grains and sparged, a process of pouring hot water through the grain to get all of the wort.



WHAT'S INSIDE?



Boiling:
The wort is then brought to a boil. At this point the hops are added. This is done because the heat helps to break down the protein and also to extract the alpha acids, this is the bitter taste in the beer. Most sugar is added at this point. At the end the hops are sparged.



Pitching the Yeast:

After the wort has boiled for an hour and the temperature is brought down, before 100% of the protein is added. The type of beer will determine the type of yeast. After sugar is added yeast is added to the wort. The yeast is added to the wort to reproduce and go through fermentation.

Fermentation:

This happens when the yeast goes through anaerobic fermentation. For this to happen the protein and sugars have to be small enough for the yeast to eat. Fermentation may take up to 2 weeks to complete.



Bottling:

Some fermentation may still happen in the bottle. Some bottles are used to prevent the beer from over-fermenting. It indicates the force of alpha acid, which can lead to over-fermenting. The bottles should be made of dark glass.

Chemicals in beer!

Carbon
Found in most compounds in beer part of sugars, alcohol and protein and from these sugars come ethanol, the alcohol in beer.

Oxygen & Hydrogen
Hydrogen is used in aerobic respiration that the yeast goes through. Both are found in many chemical formulas through the brewing process. Together they are one of the most important part of beer.

Nitrogen
In the proteins and amino acids that come from the malt required by the yeast to grow and reproduce.



Yeast



Ale Yeast:
Saccharomyces cerevisiae. Gives complex, fruity aroma and flavors. Fermentations. Ferments at 60-70°C. Does a completely different sugars. (Source: 14)

Lager Yeast:
Saccharomyces cerevisiae. Gives light, clean aroma and flavors. Fermentations. Ferments at 6-10°C. Does a completely different sugars. (Source: 14)



Periodic Table of Beer Styles

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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