

Table 4 Hasil analisis produk cair menggunakan HPLC dan pH meter.

No.	Sample code	Acquisition (ppm)		pH
		Acetic acid	Propionic acid	
1	BCI-M23	4,526.40	50.00	4,49
2	BC(II+III)- M22	6,761.58	57.66	4,63
3	BCII- M22	7,020	33.18	4,67
4	BCIII- M22	7.020.94	153.56	4,55
5	BC(I +II+III)-M22	7,225.84	55.44	4,61

From Table 4 it can be concluded that the process of fermentation produces organic acid. This is evidenced by a decrease in pH of the medium. Decrease in pH is not the same depending on the strain of *Bacillus circullans* and also depends on the type of substrate. 2% molasses was the best substrate among the three substrates used. While the best strain is a strain mixture of BC (I + II + III). Type of substrate affects the production of organic acids can be explained by the level of oxidation of the substrate. Molasses is the liquid that contains high sugar in the form of monosaccharide. The most preferred by microorganisms compared to the disaccharide (sucrose). The content of monosaccharide accelerate the adaptation time in the growth of microorganisms. At the same fermentation conditions, the concentration of monosaccharide will result in higher metabolic products. Since the product is an organic acid, the pH can indicate the amount of total organic acids. As shown in Table 4. Acid content in the fermentation medium is approaching 2%. It can be concluded that *Bacillus circullans* can also produce acetic acid in addition to produce hydrogen. The productivity of acetic acid can be increased by increasing the concentration of sugar in the medium. This can be done in a continuous fermentation process.

3.2 Hydrogen Content in Gas Product of Fermentation by Using *Bacillus circulans*

The results of gas chromatography (GC) analysis showed that hydrogen content in gas product of fermentation was very low. It was observed on almost all single inoculants. Mixture of inoculants BC (II+III) produced the highest hydrogen product with the content of 0.075%. Based on the fact, it could be concluded that *Bacillus circulans* could produced hydrogen when it worked in mix culture (or cooperated) with other BC strain in the mixed culture.