Table 7. Effect of phenol and DMC mole ratio on O-methylation of phenol.

Catalyst	Phenol: DMC	Conversion of phenol (%)	Selectivity of anisole (%)
S100	0.5	62.3	74.7
	0.66	46.2	57.1
	1	38.7	54.1
S100Ca(0.5)	0.5	61.6	77.2
	0.66	54.5	60.8
	1	49.6	55.7
S100Ca(1)	0.5	60.4	77.9
	0.66	53.4	58.4
	1	46.7	54.2
S100Ca(2)	0.5	59.7	78.4
	0.66	51.6	56.8
	1	45.5	52.7

Phenol conversion and the selectivity of anisole were calculated using equations 1, and 2 respectively.

% Phenol conversion = [(Mole phenol $_{inlet}$ - Mole phenol $_{outlet}$)/Mole phenol inlet] X 100 - (1).

% Selectivity for Anisole = [(Mole of Anisole/Mole of Anisole+ Mole of CH_3OH] X 100 --- (2).

4. Conclusions

The synthesized parent MFI zeolites were exchanged successfully with $Ca(NO_3)_2$ solution with three different W/V % (0.5%, 1% and 2%). The formation of zeolite phases as well as incorporation of Ca in samples were determined by XRD, FTIR, TGA, UV-Vis, N_2 adsorption-desorption isotherm and SEM. The synthesized samples were used to carry out O-methylation of phenol with dimethyl carbonate. In case of all the catalysts, conversion was found to increase with time on stream. It was suggested that, the yield of anisole for different dimethyl carbonate: phenol molar ratios increased continuously with the reaction time. The effect of phenol and dimethyl carbonate mole ratio on product formation was also evaluated. In this study, a good catalyst has been synthesized that is selective towards synthesis of anisole at quite low temperature in comparison to others that have already been reported. Moreover, the samples contain quite low amount of Ca. Thus, it may be concluded that the noble catalyst for selective production of anisole is S100Ca (2).

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