SUPPLEMENTARY MATERIAL

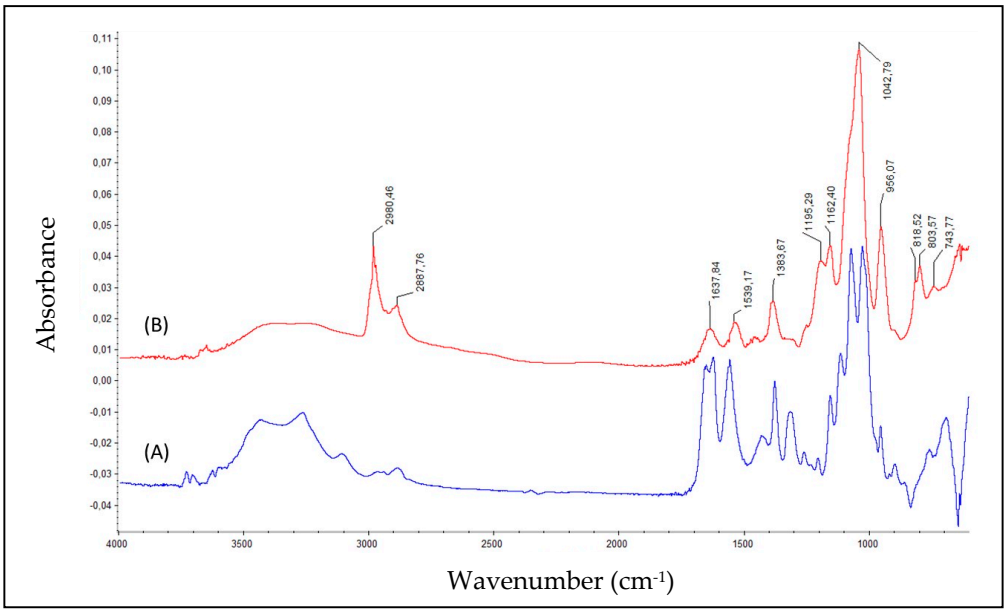

Figure S1. FTIR spectra of chitin (Chi) (**A**) and phosphorylated chitin (Chi-P) (**B**) .

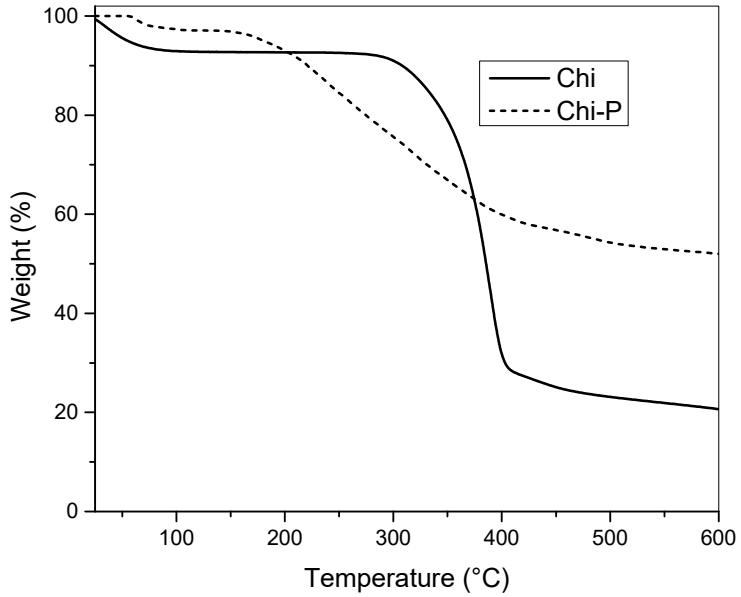

Figure S2. TGA analysis of chitin (Chi) and phosphorylated chitin (Chi-P).

Samples	Temperature (°C)			Weight loss
	Onset	Peak	End	(%)
Chi	273.1	316.4	345.4	12.1
	345.5	384.1	418.4	60.2
Chi-P	135.7	243.5	297.4	20.8
	297.6	316.4	430.2	18.3
	445.9	480.1	512.8	3.1

Figure S3. Thermogravimetric data of chitin (Chi) and phosphorylated chitin (Chi-P).

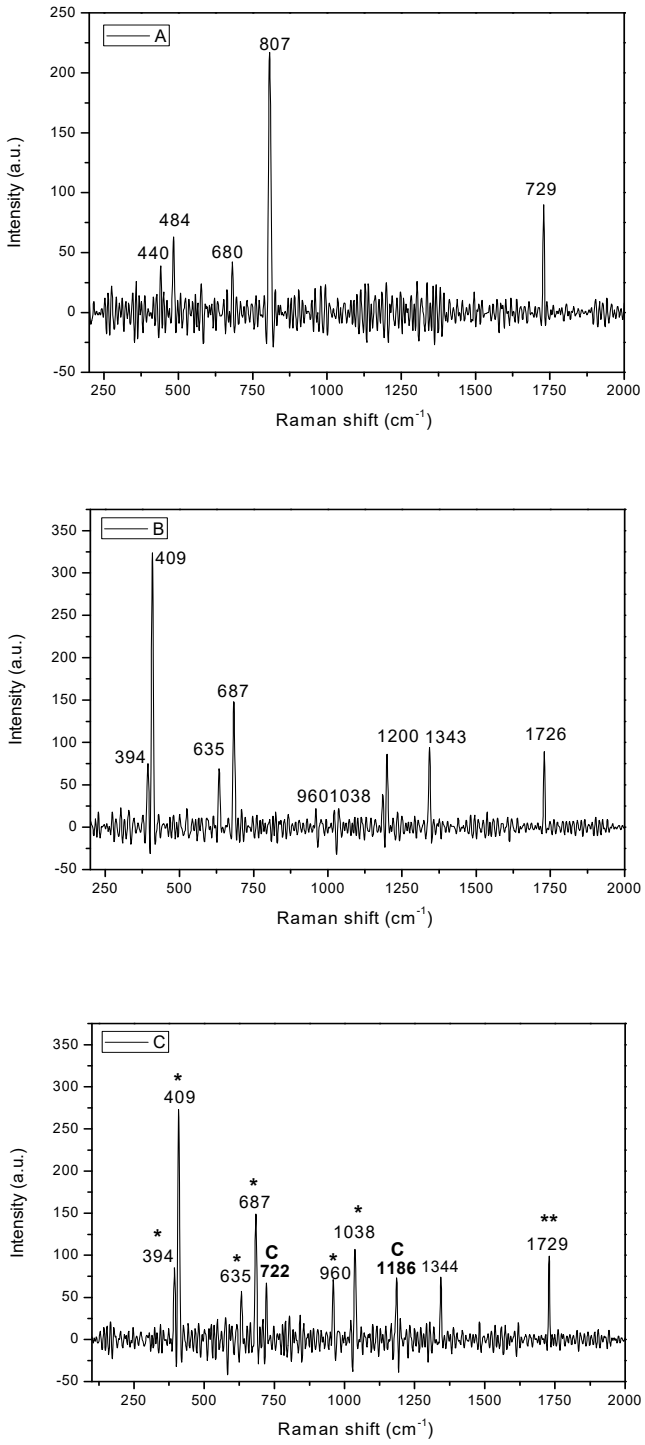

Figure S4. Raman spectra after EC essays. Surface of ITO (**A**), starting Chi-P powder (**B**), and $CaCO_3$ crystals grown on Chi-P (**C**). Designation letter C in graph C corresponds to calcite and the symbols of * and ** as active Raman signal corresponds to Chi-P and ITO, respectively.

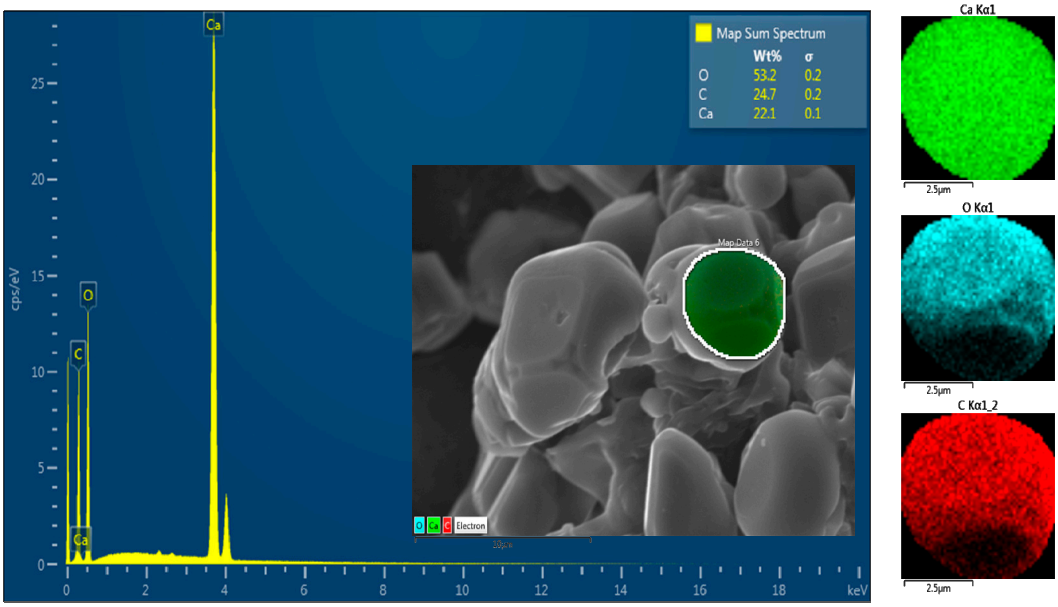

Figure S5. SEM-EDS of spherical calcite particles grown on ITO substrate.

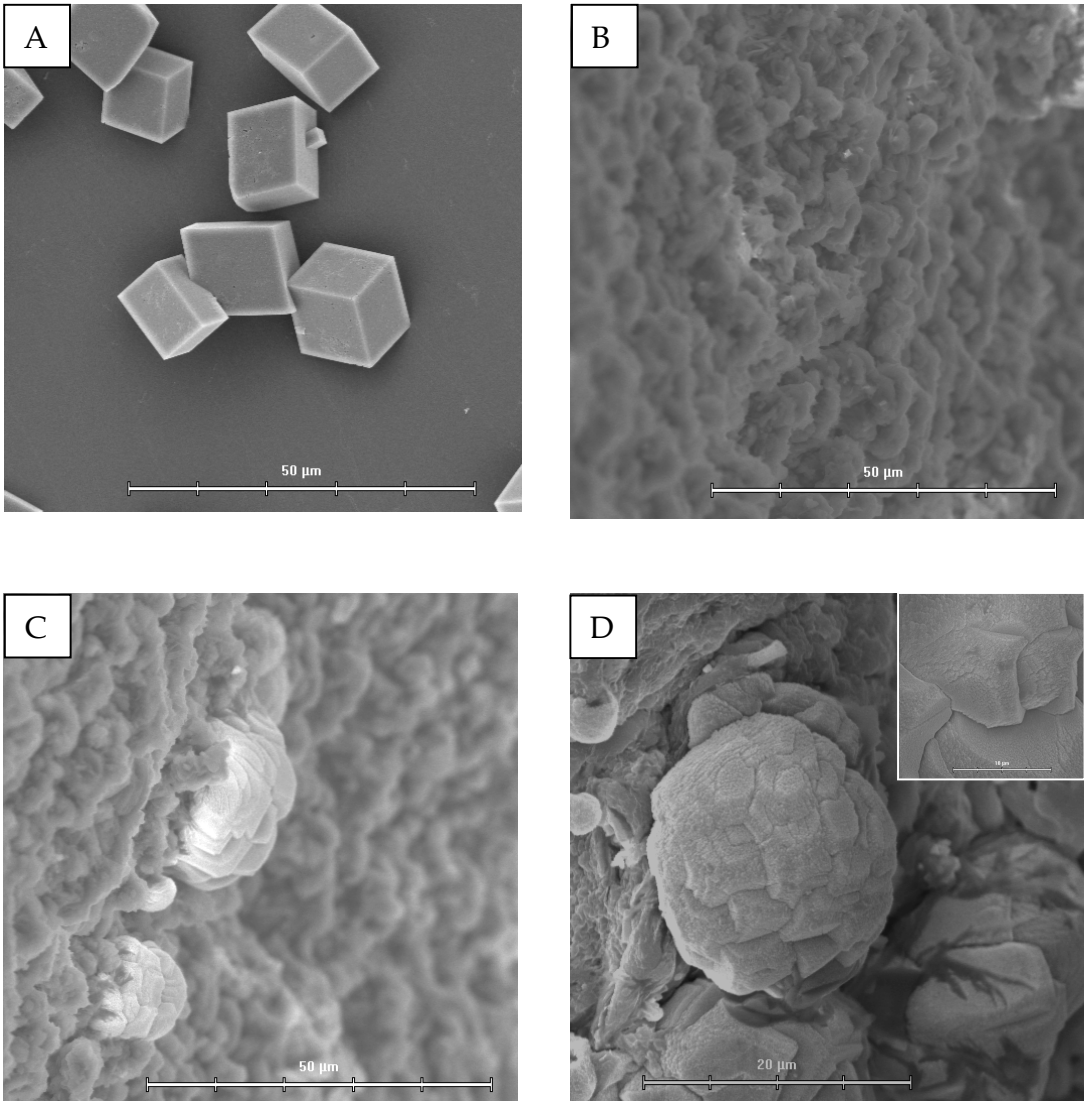

Figure S6. SEM images of $CaCO_3$ crystals obtained through GD method. Calcite control (**A**), surface of Chi-P (**B**), truncated calcite (**C,**) and aggregates calcite in spherical arrangement (**D**).