**Supplementary Material for**

**“pH-triggered release of boron and thiamethoxam from boric acid crosslinked carboxymethyl cellulose hydrogel based formulations”**

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1. *Drying kinetics of partially dehydrated feed mass*

A hot air oven (Temperature range: room temperature to 200 ℃) was used for drying rate experiment. Pre-weighed partially dehydrated feed masses were cut into small pieces and kept in hot air oven (110 ℃). The moisture content (%) of the samples was determined gravimetrically at definite time period. The drying kinetics is shown in Supplementary figure 1. It was observed that the content of boric acid did not play any significant role in the drying kinetics and all the samples get completely dehydrated after 4hr.

**Fig. S1.** Drying kinetics of partially dehydrated feed mass of representative samples (BA-CMC-1, BA-CMC-4 and BA-CMC-7)

2. *Swelling equilibrium in deionized water*

Swelling equilibrium of developed hydrogels was observed in deionized water. It showed that all the BA-CMCs achieved equilibrium at 2hr. This pattern is different from the swelling experiment in buffer solutions. The slower achievement of equilibration time in buffer solution indicates the screening effect of the functional groups present in BA-CMC hydrogels by ions present in buffer solutions.

**Fig. S2.** Absorbency kinetics of BA-CMCs in deionized water

3. *Cumulative release of B from BA-CMCs*



**Fig. S3.** Cumulative release of B from BA-CMC hydrogel formulations at pH 4.2 (A), 7.0 (B) and 9.2 (C)

4. *Cumulative release of thiamethoxam from BA-CMCs*



**Fig. S4.** Kinetics of thiamethoxam release from BA-CMC-Ts hydrogel formulations at pH 4.2 (A), 7.0 (B) and 9.2 (C)

5. *Fitting of thiamethoxam release data in mathematical models*



**Fig. S5.** Curve fitting of thiamethoxam release data (BA-CMC-6-T) at pH 4.2, 7.0 and 9.2 to the test equations (Eq 7, Eq. 8 and Eq. 9)