CLAIMS

1. A hydrogel composition with enhanced water absorption, wherein the raw materials comprise carboxymethyl cellulose-based materials, alginic acid-based materials, readily soluble materials, a calcium source, and silicon dioxide, and mass relationships of the components in the raw materials satisfy:

$W_1 = m_2/(m_1 + m_2) \times 100\%$, and $10\% \leq W_1 \leq 70\%$;

$W_2 = m_5/(m_1 + m_2 + m_5 + m_6) \times 100\%$, and $0\% \leq W_2 \leq 40\%$;

$W_3 = m_6/(m_1 + m_2 + m_5 + m_6) \times 100\%$, and $5\% \leq W_3 \leq 30\%$;

$W_4 = (m_1 + m_2)/(m_1 + m_2 + m_5 + m_6) \times 100\%$, and $55\% \leq W_4 \leq 90\%$; and

$f = m_4/m_3$, and $0.1 \leq f \leq 2.0$, wherein

m_1 is mass of the carboxymethyl cellulose-based materials, m_2 is mass of the alginic acid-based materials, m_3 is mass of carboxyl groups in the alginic acid-based materials, m_4 is a mass of Ca^{2+} in the calcium source, m_5 is a mass of silicon dioxide, and m_6 is mass of the readily soluble materials.

2. The composition according to claim 1, wherein W_1 satisfies: $10\% \leq W_1 \leq 70\%$, W_2 satisfies: $5\% \leq W_2 \leq 30\%$, W_3 satisfies: $5\% \leq W_3 \leq 25\%$, W_4 satisfies: $65\% \leq W_4 \leq 90\%$, and f satisfies: $0.2 \leq f \leq 2.0$.

3. The composition according to claim 1 or 2, wherein a solubility of the readily soluble materials is greater than a solubility of at least one of the carboxymethyl cellulose-based materials and the alginic acid-based materials.

4. The composition according to claim 1, wherein the carboxymethyl cellulose-based materials have a viscosity of ≥ 4000 mPa·s in a solution at a concentration of 2%.

5. The composition according to claim 1, wherein the alginic acid-based materials have a viscosity of ≥ 2000 mPa·s in a solution at a concentration of 2%.

6. The composition according to claim 1, wherein the calcium source comprises at least one selected from the group consisting of calcium carbonate, calcium chloride, calcium citrate, calcium lactate, calcium gluconate, calcium acetate, and calcium phosphate.

7. The composition according to claim 1, wherein the composition has a particle size of 0.1 mm to 3 mm.

8. A method for preparing the composition according to any one of claims 1 to 7, characterized by comprising dispersing carboxymethyl cellulose-based materials, alginic acid-based materials, and silicon dioxide in a solution, uniformly mixing and drying to obtain Material A, and then mixing Material A with a calcium source and readily soluble materials.

9. The preparation method according to claim 8, wherein during the preparation of Material A, a polymer concentration in the solution is 4% to 10%, and a drying temperature is 45°C to 100°C.

10. Use of the composition according to any one of claims 1 to 7 in a preparation of a space-occupying product in a digestive tract.

11. The composition according to claim 2, wherein W_1 satisfies: $12\% \leq W_1 \leq 25\%$, W_2 satisfies: $9\% \leq W_2 \leq 25\%$, W_3 satisfies: $5\% \leq W_3 \leq 20\%$, W_4 satisfies: $70\% \leq W_4 \leq 90\%$, and f satisfies: $0.4 \leq f \leq 2.0$.

12. The composition according to claim 3, wherein the solubility of the readily soluble materials is greater than or equal to 100 g/L; and

the readily soluble materials comprise at least one selected from the group consisting of polyvinyl alcohol, polyethylene glycol, cyclodextrin, and sucrose.

13. The composition according to claim 4, wherein the carboxymethyl cellulose-based materials comprise carboxymethyl cellulose and salts thereof, and the salts of carboxymethyl cellulose comprise any one selected from the group consisting of sodium carboxymethyl cellulose, potassium carboxymethyl cellulose, and ammonium carboxymethyl cellulose.

14. The composition according to claim 5, wherein the alginic acid-based materials comprise alginic acid and salts thereof, and the salts of alginic acid comprise any one selected from the group consisting of sodium alginate, potassium alginate, and ammonium alginate.

15. The composition according to claim 6, wherein the calcium source is a calcium source of low solubility; and the calcium source of low solubility is one selected from the group consisting of calcium lactate, calcium carbonate, and calcium phosphate.