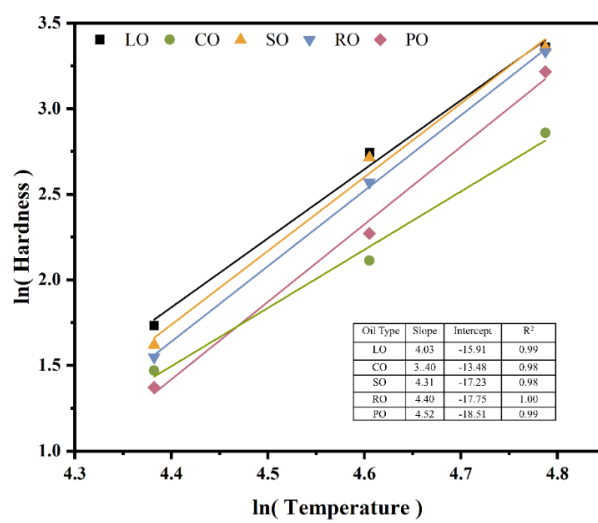
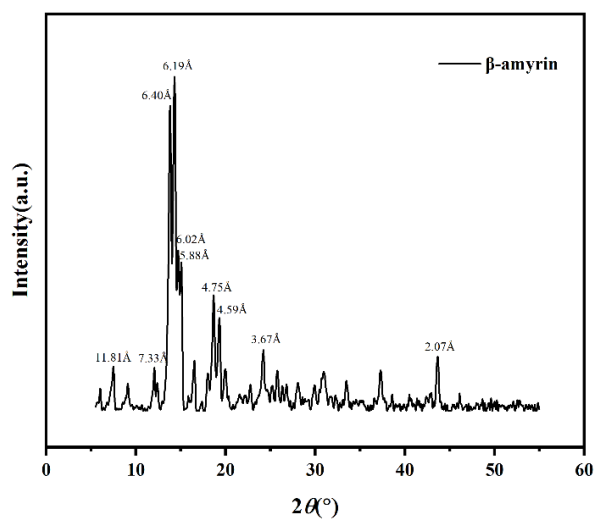


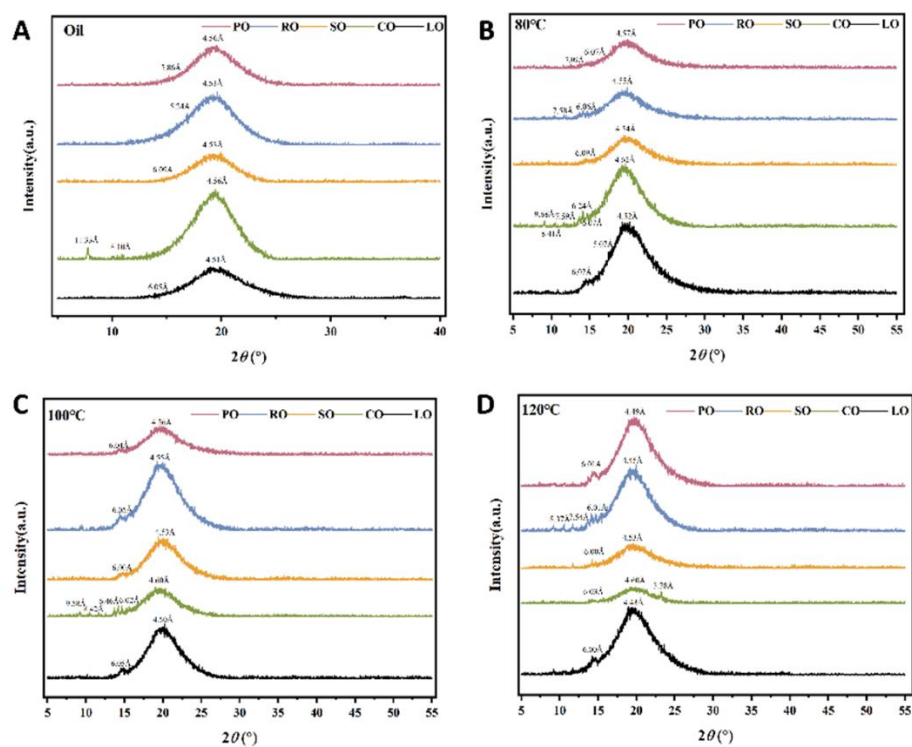
## Supplementary Figures



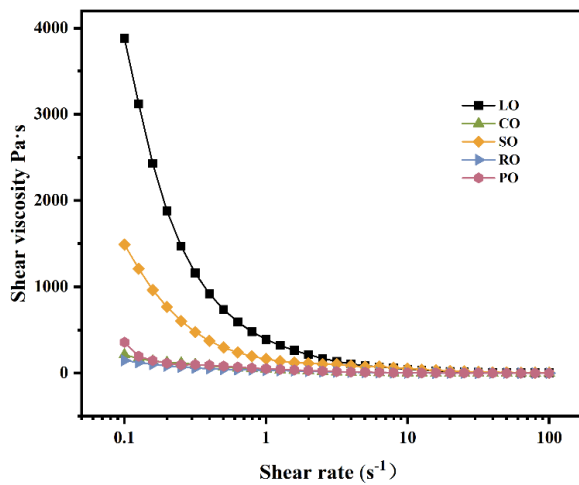
**Figure S1:** Relationship between hardness and preparation temperature.



**Figure S2:** XRD pattern of  $\beta$ -amyrin



**Figure S3:** XRD patterns of oleogels. (A) XRD patterns of different edible oils.(B-D) preparation temperatures of 80°C, 100°C and 120°C respectively.



**Figure S4:** Viscosity profiles of  $\beta$ -amyrin-based oleogels prepared with different oil types

## Supplementary Tables

**Table S1:** FO, CO, SO, RO, PO (g/100 g) Major fatty acid composition and total polar fraction (TPC%)

| Types | Fatty acid Structure (%) |        |        |        |        |        |        | TPC(%) |
|-------|--------------------------|--------|--------|--------|--------|--------|--------|--------|
|       | C12: 0                   | C14: 0 | C16: 0 | C18: 0 | C18: 1 | C18: 2 | C18: 3 |        |
| LO    | 0                        | 0.03   | 5.06   | 0      | 21.03  | 20.43  | 52.00  | 16     |
| CO    | 49.1                     | 21.8   | 6.4    | 1.20   | 0      | 6.1    | 1.2    | 5      |
| SO    | 0.03                     | 0.1    | 6.31   | 3.54   | 27.95  | 61.62  | 0.29   | 12     |
| RO    | 0                        | 0.05   | 3.63   | 1.10   | 76.35  | 12.20  | 1.10   | 4      |
| PO    | 0.13                     | 0.79   | 37.05  | 0.16   | 45.93  | 10.43  | 0.16   | 11     |

**Table S2:** Relative crystallinity (%) of oleogels at different preparation temperatures

| Types | 80°C         | 100°C        | 120°C        |
|-------|--------------|--------------|--------------|
| LO    | 74.42±0.26   | 77.783±2.195 | 86.907±2.116 |
| CO    | 70.34±0.60   | 70.650±3.120 | 70.867±2.698 |
| SO    | 68.14±3.09   | 72.327±0.080 | 76.607±0.601 |
| RO    | 65.49±3.06   | 75.573±0.703 | 79.207±3.339 |
| PO    | 65.580±1.763 | 70.477±1.419 | 77.850±1.675 |

**Table S3:** Thermal behavioral characteristics of oleogels prepared with different oil types with 4%  $\beta$ -amyryn

| Types | Temperature rate (°C/min) | Heating           |                   |                   | Cooling           |                   |                   |
|-------|---------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|       |                           | Ton (°C)          | Tm (°C)           | $\Delta H_m$      | Ton (°C)          | Tc (°C)           | $\Delta H_c$      |
| LO    | 5                         | $-33.58 \pm 0.03$ | $-29.54 \pm 0.13$ | $49.21 \pm 0.06$  | $-62.30 \pm 0.12$ | $-38.93 \pm 0.01$ | $17.04 \pm 0.04$  |
|       | 10                        | $-32.85 \pm 0.10$ | $-28.03 \pm 0.06$ | $51.37 \pm 0.03$  | $-59.63 \pm 0.27$ | $-39.09 \pm 0.14$ | $103.56 \pm 0.21$ |
| CO    | 5                         | $7.72 \pm 0.13$   | $24.16 \pm 0.06$  | $96.64 \pm 0.23$  | $-19.81 \pm 0.0$  | $3.90 \pm 0.05$   | $94.19 \pm 0.06$  |
|       | 10                        | $7.81 \pm 0.04$   | $25.32 \pm 0.08$  | $101.23 \pm 0.20$ | $-7.58 \pm 0.01$  | $2.15 \pm 0.11$   | $157.46 \pm 0.17$ |
| SO    | 5                         | $-47.21 \pm 0.22$ | $-27.19 \pm 0.08$ | $48.14 \pm 0.22$  | $-54.00 \pm 0.06$ | $-36.39 \pm 0.08$ | $11.42 \pm 0.05$  |
|       | 10                        | $-41.81 \pm 0.08$ | $-26.84 \pm 0.09$ | $60.60 \pm 0.29$  | $-45.28 \pm 0.10$ | $-39.82 \pm 0.10$ | $40.26 \pm 0.20$  |
| RO    | 5                         | $-36.88 \pm 0.02$ | $-21.41 \pm 0.08$ | $55.16 \pm 0.21$  | $-57.52 \pm 0.22$ | $-27.36 \pm 0.06$ | $26.58 \pm 0.12$  |
|       | 10                        | $-32.61 \pm 0.11$ | $-18.34 \pm 0.07$ | $55.80 \pm 0.45$  | $-56.37 \pm 0.07$ | $-27.96 \pm 0.31$ | $21.65 \pm 0.26$  |
| PO    | 5                         | $-20.84 \pm 0.23$ | $3.83 \pm 0.00$   | $64.68 \pm 0.10$  | $-46.73 \pm 0.04$ | $1.68 \pm 0.03$   | $51.78 \pm 0.11$  |
|       | 10                        | $-19.68 \pm 0.03$ | $5.48 \pm 0.06$   | $69.00 \pm 0.70$  | $-26.06 \pm 0.08$ | $1.18 \pm 0.11$   | $76.41 \pm 0.02$  |

**Table S4:** Physical properties of the oleogels. Including linear ultimate stress ( $\gamma_0$ ), supercritical strain values ( $\lambda_c$ , stress values for  $G'=G''$ ), and ( $G'=a \cdot \omega^b$ ) under the power-law exponent where  $a(\text{Pa} \cdot \text{s}^b)$  and  $b$  are dimensionless flow behavior exponent.

| Types | $a(\text{Pa} \cdot \text{s}^b)$ | $b$              | $\gamma_0$ (%)   | $\lambda_c$       |
|-------|---------------------------------|------------------|------------------|-------------------|
| LO    | $13172.37 \pm 478.21a$          | $0.04 \pm 0.00b$ | $0.04 \pm 0.00a$ | $19.95 \pm 0.11a$ |
| CO    | $128.98 \pm 8.72c$              | $0.15 \pm 0.01a$ | $0.02 \pm 0.01b$ | $1.59 \pm 0.07d$  |
| SO    | $5400.25 \pm 454.32b$           | $0.05 \pm 0.01b$ | $0.02 \pm 0.00b$ | $7.95 \pm 3.46c$  |
| RO    | $2619.07 \pm 104.45d$           | $0.05 \pm 0.02b$ | $0.03 \pm 0.02a$ | $19.95 \pm 0.97a$ |
| PO    | $3102.37 \pm 388.00c$           | $0.05 \pm 0.04b$ | $0.02 \pm 0.00b$ | $15.85 \pm 0.22b$ |