Effect of Radiation Induced Crosslinking on Thermal Aging Properties of Ethylene-Tetrafluoroethylene for Aircraft Cable Materials

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The results of activation energy of ETFE experiments are shown in Figure S1.

![DSC curves of the non-isothermal oxidation induction temperature of ETFE unirradiated at different heating rates.](image)

**Figure S1.** DSC curves of the non-isothermal oxidation induction temperature of ETFE unirradiated at different heating rates.

| Heating Rate/(°C/min) | Oxidation Induction Temperature /°C | Peak/°C |
|-----------------------|------------------------------------|--------|
| 5                     | 454.80                             | 463.68 |
| 10                    | 471.17                             | 478.69 |
| 15                    | 478.84                             | 487.14 |
| 20                    | 482.57                             | 492.20 |

**Table S1.** Non-isothermal oxidation induction date obtained from the DSC scans at different heating rates.
The values of Ea (212.86 kJ/mol) can be calculated according to the Kissinger’s equation.

Table S2. Non-isothermal oxidation induction date obtained from the DSC scans at different heating rates.

| Heating Rate/(°C/min) | Oxidation Induction Temperature/°C | Peak/°C |
|-----------------------|-----------------------------------|---------|
| 5                     | 294.98                            | 306.82  |
| 10                    | 307.15                            | 322.16  |
| 15                    | 314.57                            | 330.11  |
| 20                    | 320.17                            | 337.51  |
The values of $E_a$ (127.28 kJ/mol) can be calculated according to the Kissinger's equation.

Figure S4. Linear relationship of $\ln(\beta / T_{\text{max}}^2)$ versus $1/T_{\text{max}}$.

![Figure S4](image)

$Y=15.28806-15309.1792X$

$R^2=0.99973$

Table S3. Non-isothermal oxidation induction date obtained from the DSC scans at different heating rates.

| Heating Rate/(°C/min) | Oxidation Induction Temperature/°C | Peak/°C |
|-----------------------|-----------------------------------|---------|
| 5                     | 348.92                            | 381.80  |
| 10                    | 364.82                            | 399.55  |
| 15                    | 375.10                            | 411.48  |
| 20                    | 388.85                            | 420.46  |

Figure S5. DSC curves of the non-isothermal oxidation induction temperature of ETFE absorbed 120 kGy at different heating rates.

![Figure S5](image)
Figure S6. Linear relationship of $\ln(\beta/T_{\text{max}})$ versus $1/T_{\text{max}}$. The values of $E_a$ (124.37 kJ/mol) can be calculated according to the Kissinger’s equation.

Figure S7. DSC curves of the non-isothermal oxidation induction temperature of ETFE absorbed 180 kGy at different heating rates.

Table S4. Non-isothermal oxidation induction date obtained from the DSC scans at different heating rates.

| Heating Rate/(°C/min) | Oxidation Induction Temperature/°C | Peak/°C |
|-----------------------|-----------------------------------|---------|
| 5                     | 346.42                            | 380.98  |
| 10                    | 365.94                            | 400.00  |
| 15                    | 376.70                            | 411.42  |
| 20                    | 380.81                            | 423.15  |
Figure S8. Linear relationship of $\ln(\beta / T_{\text{max}}^2)$ versus $1/T_{\text{max}}$.

The values of Ea (115.02 kJ/mol) can be calculated according to Kissinger’s equation.