Table S1. The characteristic FTIR data of the pure CA and light conversion films.

Sample	ν-O-H	Δ	$ν_{as}$-COO^-	Δ	ν-COO^-	Δ	$ν_{as}$-C-O-C	Δ	ν-C-O-C	Δ
CA	3480	0	1431	0	1737	0	1215	0	1031	0
CA-Eu	3396	-84	1475	+44	1721	-16	1225	+10	1027	-4
CA-Tb	3396	-84	1481	+50	1720	-17	1231	+16	1027	-4
CA-Eu-Tb	3396	-84	1479	+48	1718	-19	1231	+16	1027	-4

Table S2. Binding energy of C1s and O1s for CA and light-conversion films.

Sample	C1s			O1s		
	C-C (C-H)	C-O	C=O	-OH	C-O	C=O
CA	284.8	286.774	289.002	531.493	531.907	532.693
CA-Eu	284.8	286.771	288.839	531.945	532.393	533.131
CA-Eu-Tb	284.8	286.730	288.733	531.740	532.297	533.060

The above data is calculated by CasaXPS.

Measurement method of the conditional viscosity: The conditional viscosity was measured using the QNO-4 viscometer (Material Testing Machine Factory, Tianjin, China) and the test method was based on GB/T 1723-93, and five sets of films were tested in parallel. The conditional viscosity of CA and CA-Eu solutions was summarized in Table S3.

Table S3. The conditional viscosity of CA and CA-Eu solutions.

Sample	Conditional viscosity (s)					Mean
	1	2	3	4	5	
CA	21.34	22.21	22.22	24.01	24.91	22.9
CA-Eu	8.75	10.00	11.45	11.84	13.20	11.0

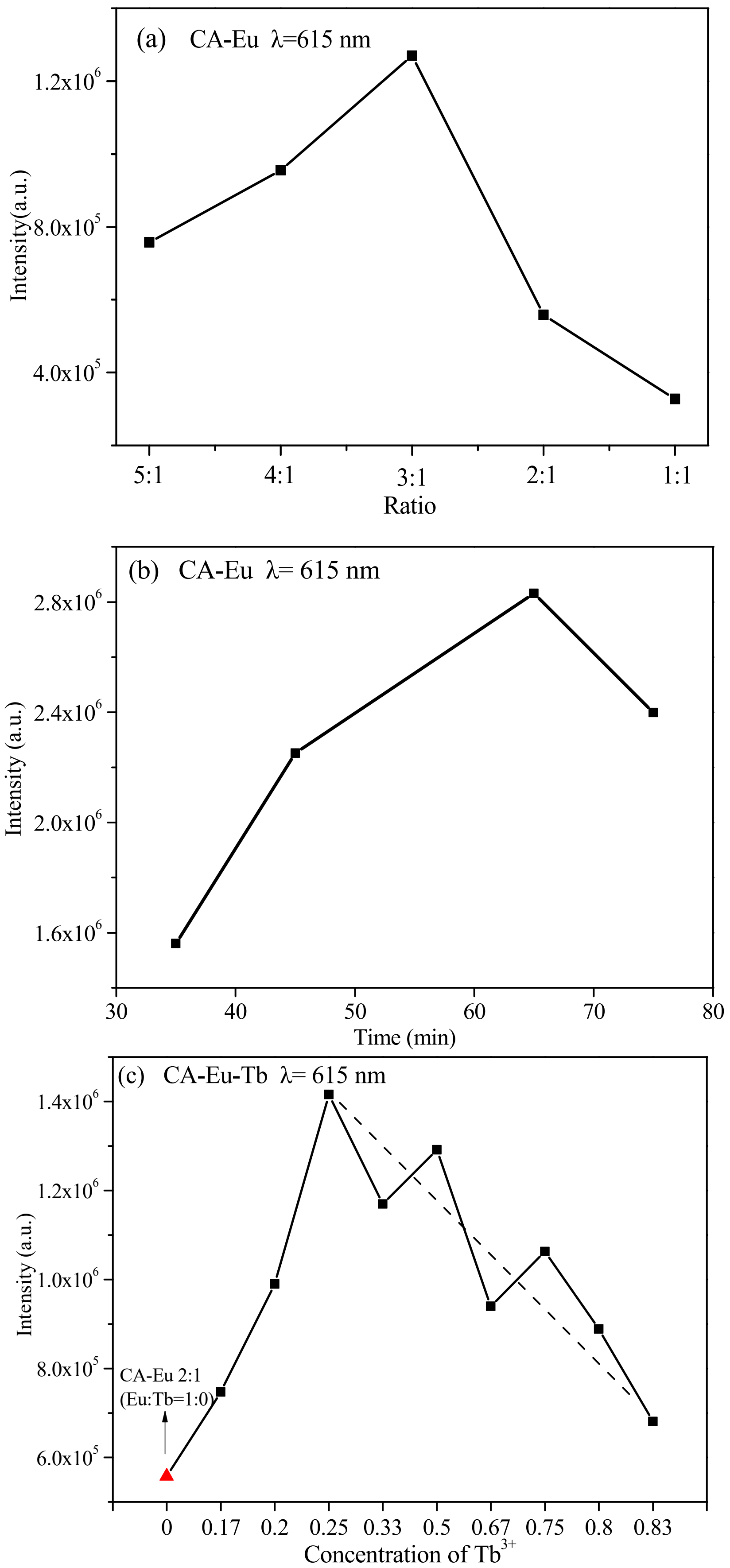

Figure S1. Fluorescence intensity of the light conversion films at the peak of 615 nm. a−the intensity of different proportions. b−the intensity of different reaction time. c−the intensity of different Eu^{3+}:Tb^{3+}

ratios. (For convenience, set the total amount of Eu^{3+} and Tb^{3+} to "1" and calculate the proportion of Tb^{3+} proportionally. And use the proportion of Tb^{3+} as the abscissa and the fluorescence intensity at 615 nm as the ordinate to plot Figure S(c).)