Electronic supplementary information for Soft Matter

Preparations of self-supporting nanofilms of metal oxides by casting processes

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Supplemental figures and tables for preparation of self-supporting nanofilms of metal oxides by spin casting.

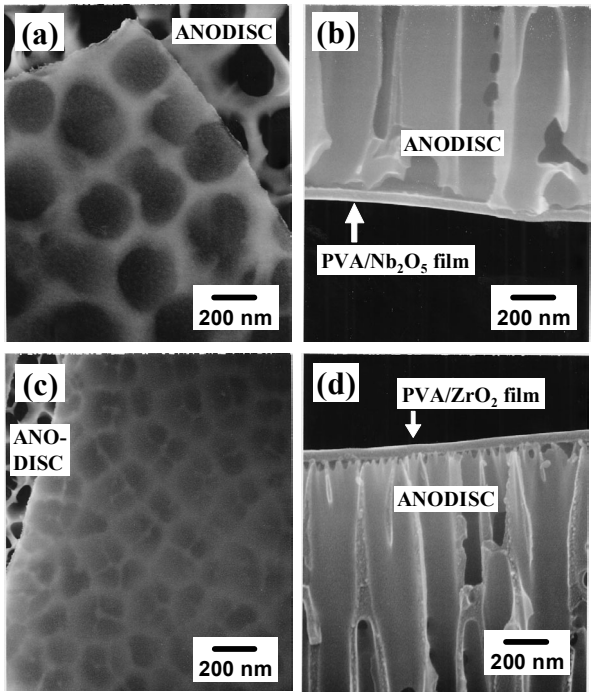

Figure S1 SEM images of top views (a, c) and side views (b, d) of a PVA/Nb_2O_5 film (sample no. **4**, Table 1) (a, b) and a PVA/ZrO_2 film (sample no. **5**, Table 1) (c, d) on ANODISCs.

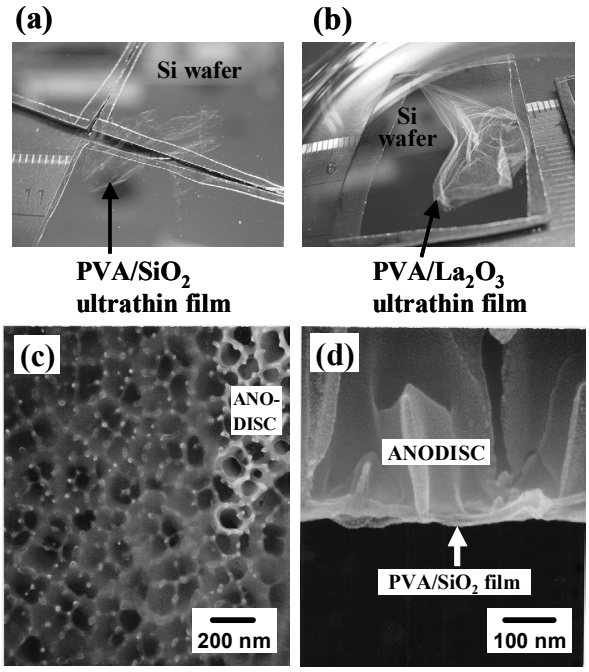

Figure S2 A PVA/SiO_2 film (sample no. **6**, Table 1) (a) and a PVA/La_2O_3 (sample no. **7**, Table 1) (b) in ethanol. SEM images of the top view (c) and the side view (d) of a PVA/SiO_2 film on an ANODISC.

Table S1 Preparation of self-supporting nanofilms of PVA/TiO_2 by using PVP as the polymer underlayer.

Film no.	PVP coating solution[a]	Film detachment[b]	Thickness / nm[c]
11	PVP(10 mg ml^{-1} in 2-buyoxyethanol)	×	nd
12	PVP(10 mg ml^{-1} in ethanol)	Δ	nd
13	PVP(50 mg ml^{-1} in ethanol)	○	60±56

a: the layer comoposition is Si/PVP/PVA/TiO_2. [$Ti(OBu)_4$] = 100 mM.

b: in ethanol.

c: mean ± S. D., nd = not determined.

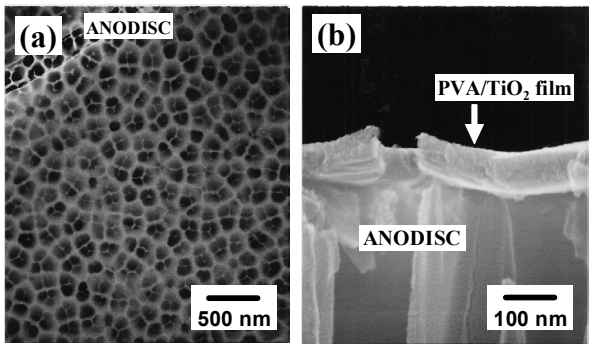

Figure S3 SEM images of the top view (a) and the side view (b) of a PVA/TiO_2 film (sample no. **13**, Table S1) on an ANODISC.

Table S2 Effect of the polymer middle layer on the film formation

Film no.	Middle layer coating solution[a]	Film size / mm^2	Film thickness / nm[b]
14	PAA(M_n 11700, 10 mM as monomer)	ca. 10	130 ± 17
15	PAA(M_n11700, 5 mg mL^{-1})	ca. 1	nd
16	PAA(M_v 450000, 5 mg mL^{-1})	ca. 2	nd
17	PAA(M_n11700, 10 mM as monomer)[c]	ca. 4	nd
18	PAA(M_n11700, 5 mg mL^{-1})[c]	> 100	77 ± 35
19	PAA(M_v 450000, 5 mg mL^{-1})[c]	ca. 4	nd
20	dextran(MW 180000-210000, 5 mg mL^{-1})	~ 15	nd

a: aqueous solution. The layer comoposition is Si/photoresist/middle layer/TiO_2. [$Ti(OBu)_4$] = 100 mM.

b: mean ± S. D., nd = not determined.

c: the layer composition is Si/photoresist/middle layer/(4-PABA + TiO_2). [$Ti(OBu)_4$] = 100 mM, [4-PABA] = 20 mM.

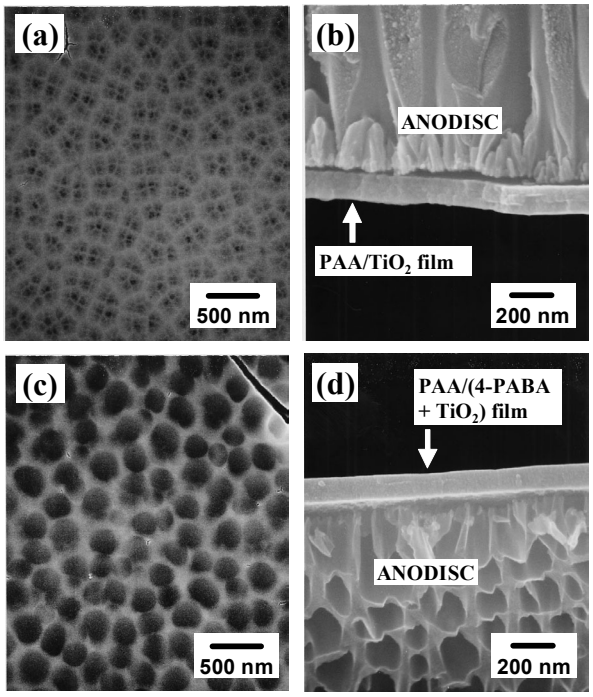

Figure S4 SEM images of top views (a, c) and side views (b, d) of a PAA/TiO_2 film (sample no. **14**, Table S2) (a, b) and a PAA/(4-PABA + TiO_2) film (sample no. **18**, Table S2) (c, d) on ANODISCs.

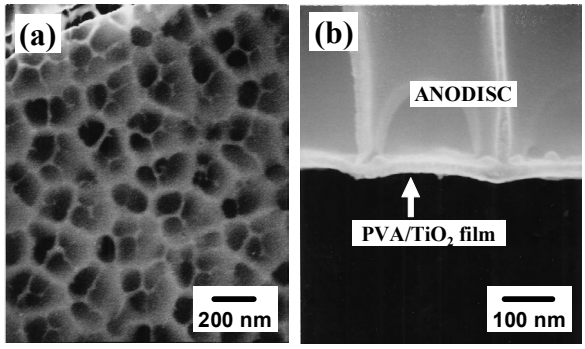

Figure S5 SEM images of the top view (a) and the side view (b) of a PVA/TiO_2 film (sample no. **22**) on an ANODISC.