Electronic supplementary materials *Mendeleev Commun*., 2023, **33**, 320–322

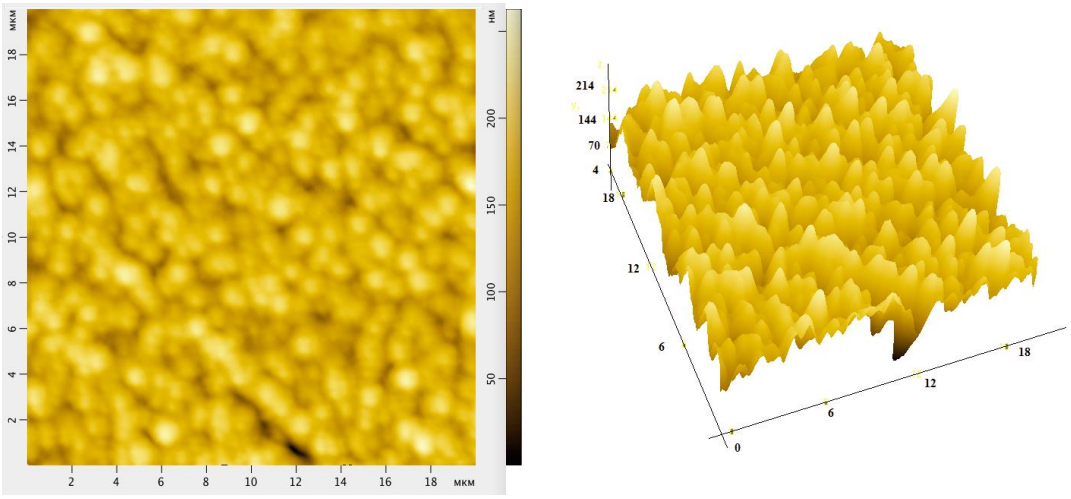
1,2,3-Triazolylfullerene-based n-type semiconductor materials for organic field-effect transistors

Zarema R. Sadretdinova, Arslan R. Akhmetov, Renat B. Salikhov, Ilnur N. Mullagaliev and Timur R. Salikhov

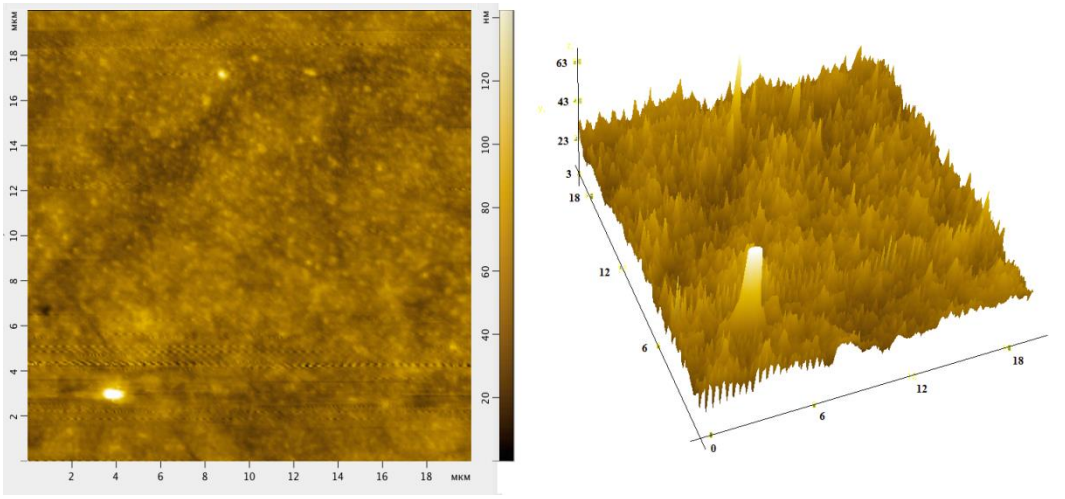
Compounds **2-6** were obtained according to Ref. 22 of the main text.

The organic field-effect transistors based on triazolylfullerenes **2-6** were fabricated as follows. Two aluminum electrodes (source and drain electrodes) were vacuum deposited on a glass substrate containing ITO (gate) and 400-nm AlOx layers acting as gate insulator. The thickness of the aluminum electrodes was 500 nm. The 200 nm thick films of fullerene derivatives were deposited by spin coating at 600 rpm for 1 minute and then kept in an oven at 60 ºC for 15 minutes to remove solvent residues. The thickness of the triazolylfullerene film was determined using AFM. The centrifugation solution contained 0.5 mg of fullerene and 200 μL of toluene. The dimensions of the drain and source contacts are 2 mm by 2 mm (channel width 2000 μm), the gap between the contacts (channel length) is 50 microns. The current–voltage characteristics were measured using the following devices: Mastech HY3005D-2 power supply unit and Tektronix DMM-4020 multimeter as an ampere meter.

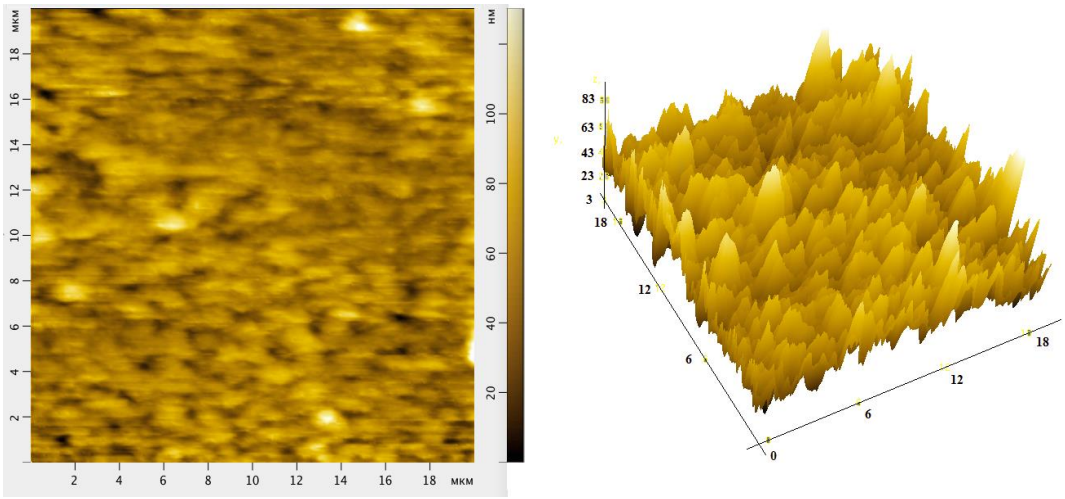
The morphology of the surfaces of the films was also studied. Atomic force microscopy (AFM) images (Figure S1) were obtained using Nanoeducator II NT-MDT instrument, scan size = 20 by 20 μm.



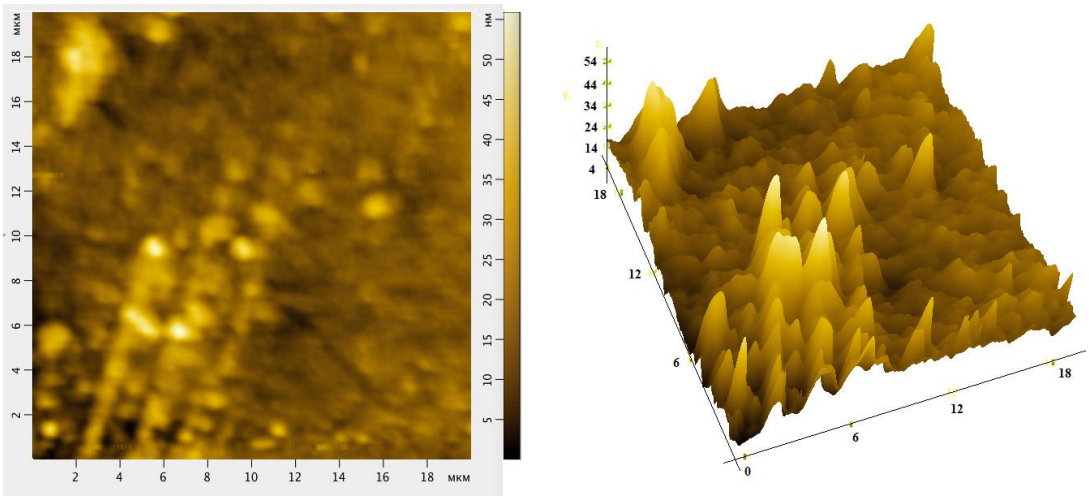
(a)


мкм
нм
2 4 6 8 10 12 14 16 18 мкм
20 40 60 80 100 120
63
43
23
3
18
12
6
0
6
12
18

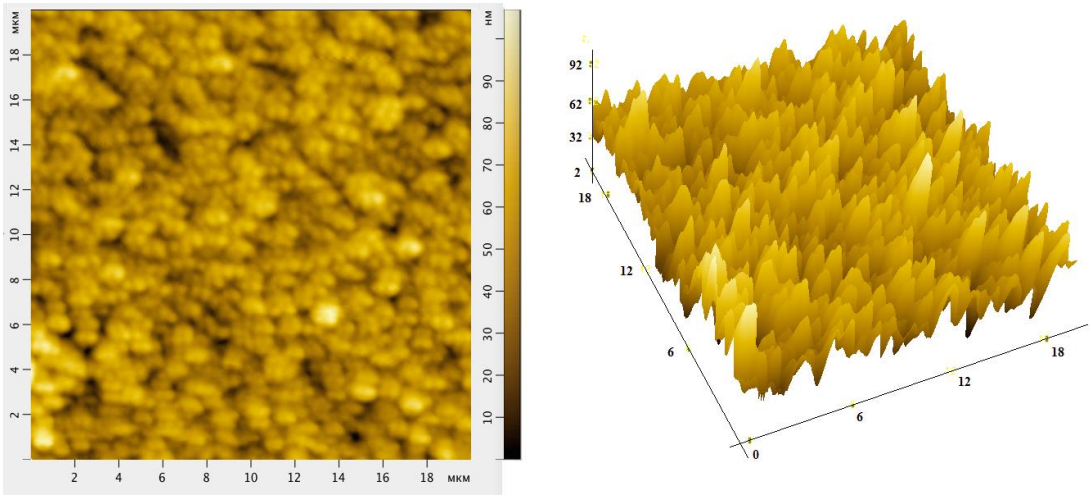
(*b*)


мкм
нм
2 4 6 8 10 12 14 16 18 мкм
20 40 60 80 100
83
63
43
23
3
18
12
6
0
6
12
18

(*c*)


мкм
нм
2 4 6 8 10 12 14 16 18 мкм
5 10 15 20 25 30 35 40 45 50
54
44
34
24
14
4
18
12
6
0
6
12
18

(*d*)



(*e*)

Figure S1. AFM image of the film formed from compound (*a*) **2**, (*b*) **3**, (*c*) **4**, (*d*) **5** and (*e*) **6**.