THE CONDITIONER IN THE ELECTRODES FOR THE SUPERCAPACITORS

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Introduction

This work deals with the examining of impact of conditioner to electrodes for the electrochemical supercapacitors .

Experimental

The electrodes are made orf metal screen, carbon, binding agent and conditioner. As a carbon various exfoliated graphites and highly conductive carbon black were used. As a binding agent Sokrat was chosen. The electrochemical measurements were done in 0.5M $LiBF_4$ solution in propylene carbonate. The glass cell for the measurements is presented on Fig.1. Experiments were performed using potentiostat AUTOLAB.

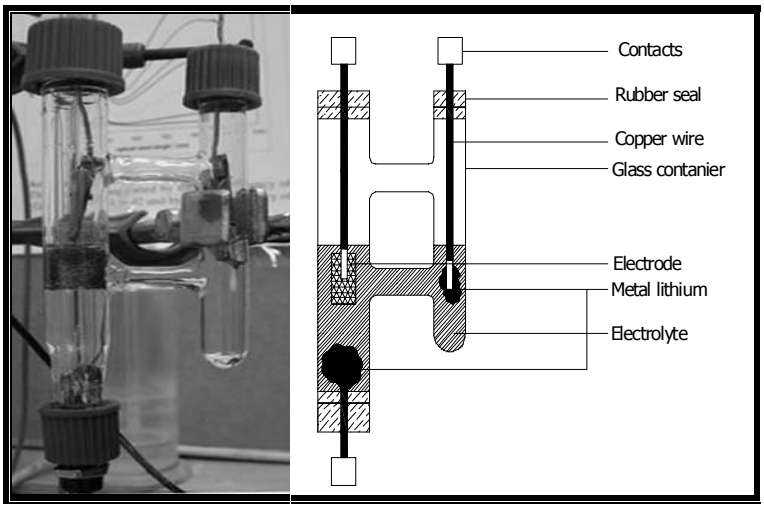

Fig.1. *Glass container for liquid electrolytes*

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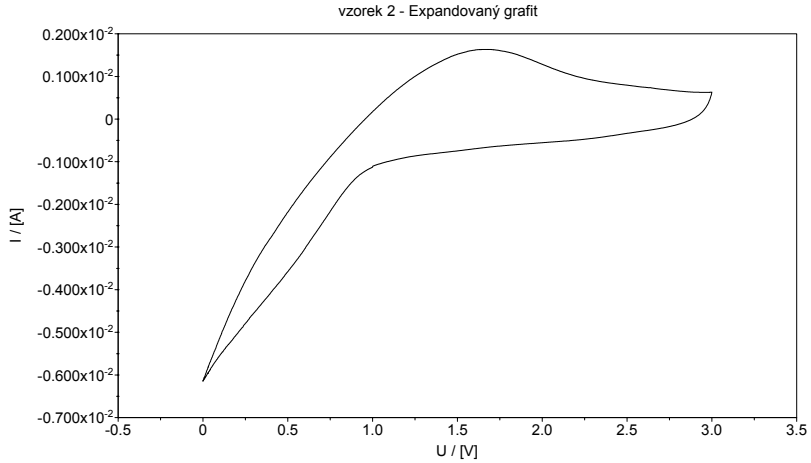

Fig. 2 *Cyclic voltammetry of the exfoliated graphite.*

The capacity is calculated from the formula:

$$C = \frac{1}{2}.\frac{\Delta I}{\alpha}$$

where C [F] is capacity, Δi [A] is difference of currents at anodic and cathodic branches and α[V/s] is the scan rate (for this measurement 0.01 V/s).

Table 1 *Results of exfoliated carbon*

sample	carbon (mg)	$LiBF_4$ (mg)	binding agent (mg)	capacity (F/g)
1	50	190	125	4.42
2	50	230	125	5.75
3	50	250	125	5.25
4	50	262	125	6.58
5	50	285	125	6.47
6	50	295	125	5.93
7	50	330	125	7.18
8	50	353	125	9.06
9	50	370	125	7.07
10	50	410	125	6.22

Table 2 *Results of Carbon black "A"*

sample	carbon (mg)	$LiBF_4$ (mg)	binding agent (mg)	capacity (F/g)
1	100	211	750	1.70
2	100	250	750	2.54
3	100	280	750	7.05
4	100	300	750	4.63
5	100	330	750	1.90
6	100	360	750	1.61

Table 3 *Results of Carbon black "B"*

sample	carbon (mg)	$LiBF_4$ (mg)	binding agent (mg)	capacity (F/g)
1	50	110	375	2.20
2	50	130	375	2.56
3	50	160	375	3.26
4	50	190	375	1.91

Table 4 *Results of Nanosorb*

sample	carbon (mg)	$LiBF_4$ (mg)	binding agent (mg)	capacity (F/g)
1	40	120	150	0.69
2	40	150	150	2.79
3	40	170	150	4.16
4	40	195	150	3.58
5	40	250	150	3.27
6	40	285	150	1.66

Conclusion

If we use more conditioner than the capacity is rising as well. The highest capacity 9.06 F/g was reached when exfoliated graphite was used.

Acknowledgments

This work was supported by the Grant FRVS 2958/G1.