Supporting Information

Ni-P@NiCo LDH Core-Shell Nanowires Decorated Nickel Foam with Enhanced Areal Specific Capacitance for High-Performance Supercapacitors

Jiale Xing[a], Jing Du[a], Xuan Zhang[b], Yubo Shao[a], Ting Zhang[a] and Cailing Xu[a]*

[a]State Key Laboratory of Applied Organic Chemistry, Key Laboratory of Nonferrous Metal Chemistry and Resources Utilization of Gansu Province, Laboratory of Special Function Materials and Structure Design of the Ministry of Education, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou 730000, China

[b]Department of Materials Engineering, KU Leuven, Leuven 3001, Belgium

C. L. Xu: Tel: +86-931-891-2589, FAX: +86-931-891-2582, Email: xucl@lzu.edu.cn;

xucl921chem@163.com

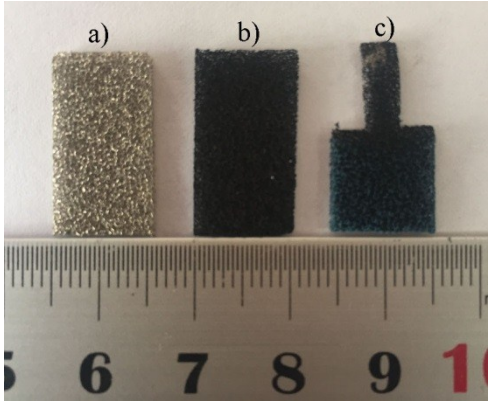

Figure S1 photograph of (a) Ni foam, (b) Ni-P and (c) Ni-P@NiCo LDH samples

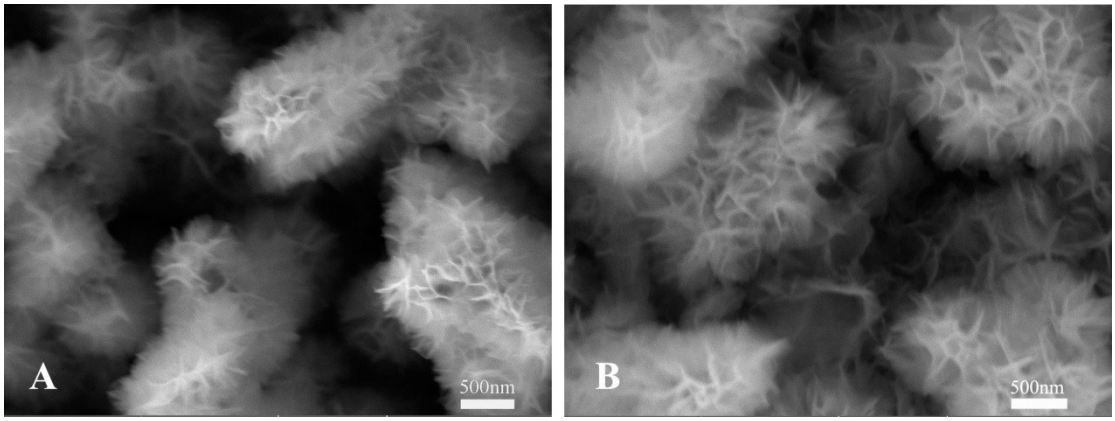

Figure S2 FESEM images of Ni-P@ NiCo LDH samples electrodeposited at 10 mv s^{-1} (A) and 30 mv s^{-1}(B) for 20 cycles.

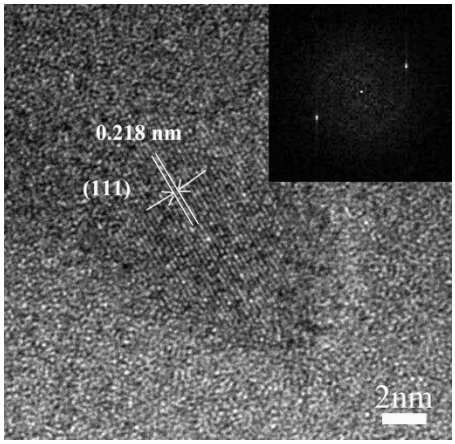

Figure S3 HRTEM image of Ni-P nanorod, Inset: FFT pattern

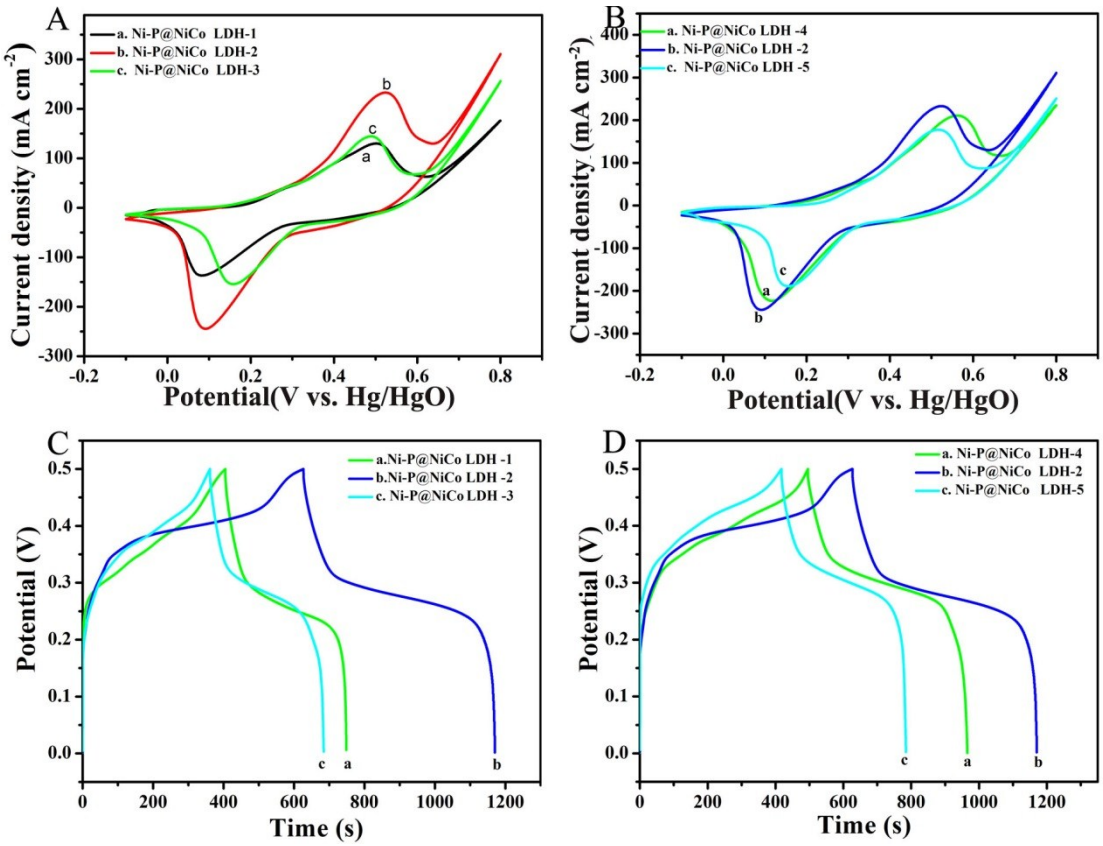

Figure S4 CV (A) and GCD (C) curves of Ni-P@NiCo LDH obtained at a scan rate of 20 mV s^{-1} for different CV cycles ; CV (B) and GCD (D) curves of Ni-P@NiCo LDH obtained at different scan rate for 20 cycles. The corresponding samples were denoted as Ni-P@NiCo LDH-1 (at 20 mV s^{-1} for 10 cycles), Ni-P@NiCoLDH-2 (at 20 mV s^{-1} for 20 cycles), Ni-P@NiCo LDH-3 (at 20 mV s^{-1} for 30 cycles), Ni-P@NiCo LDH-4 (at 10 mV s^{-1} for 20 cycles), Ni-P@NiCo LDH-5 (at 30 mV s^{-1} for 20 cycles), respectively.

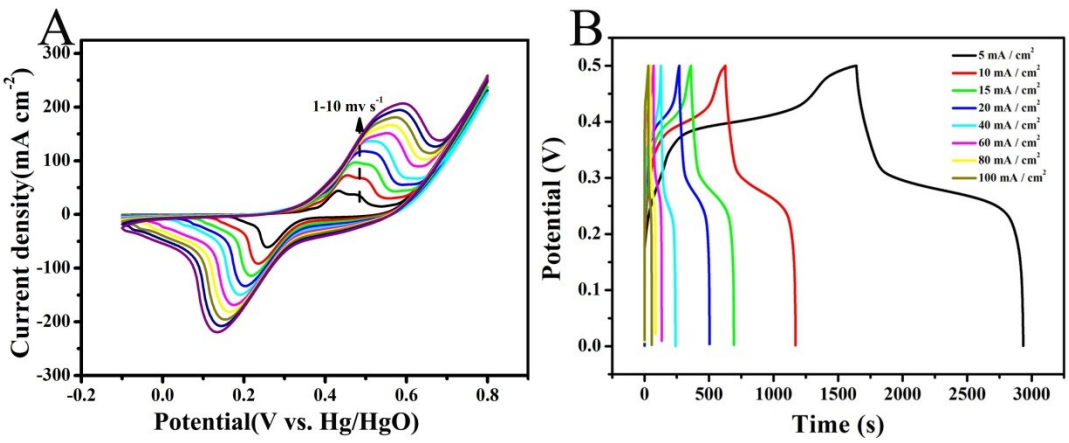

Figure S5 CV (A) and GCD (B) curves of Ni-P@NiCo LDH core-shell hybrids at various scan rates and different current densities

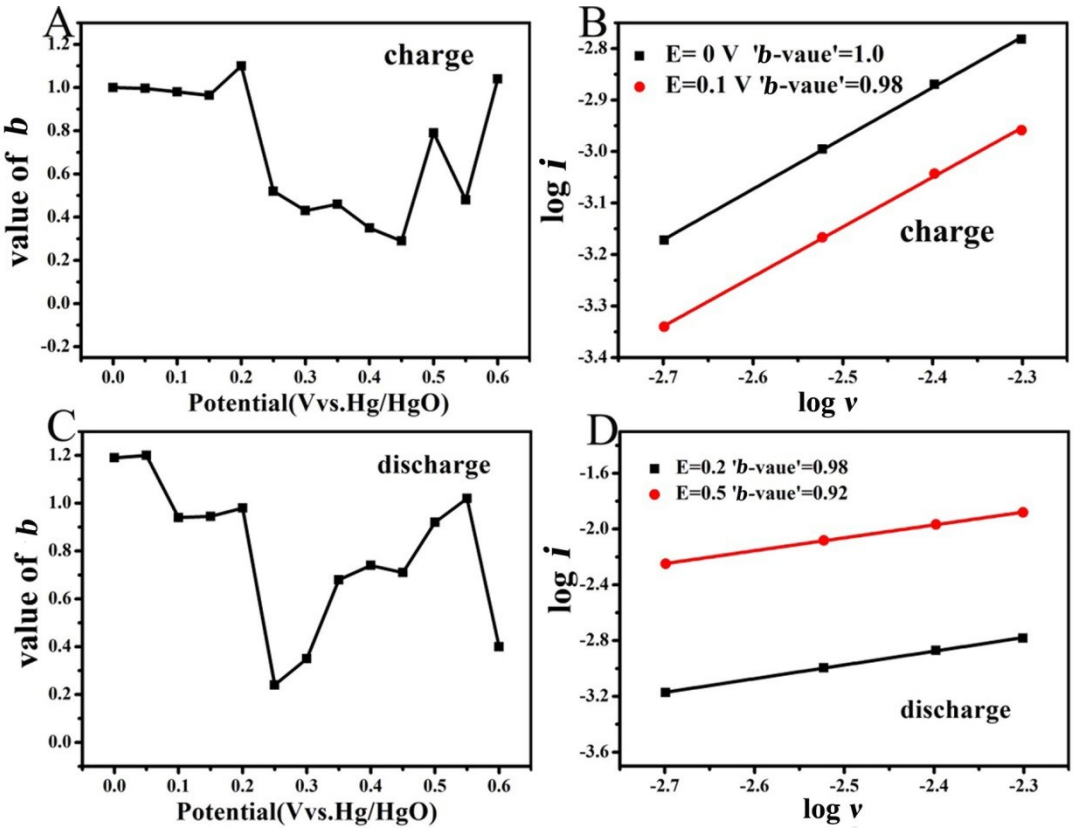

Figure S6 (A), (C) Values of *b*, which are derived from the slope of the plots of log *i* *vs.* log *v* at different potentials and (B), (D) the plots of log *i* vs. log *v* at different potentials.

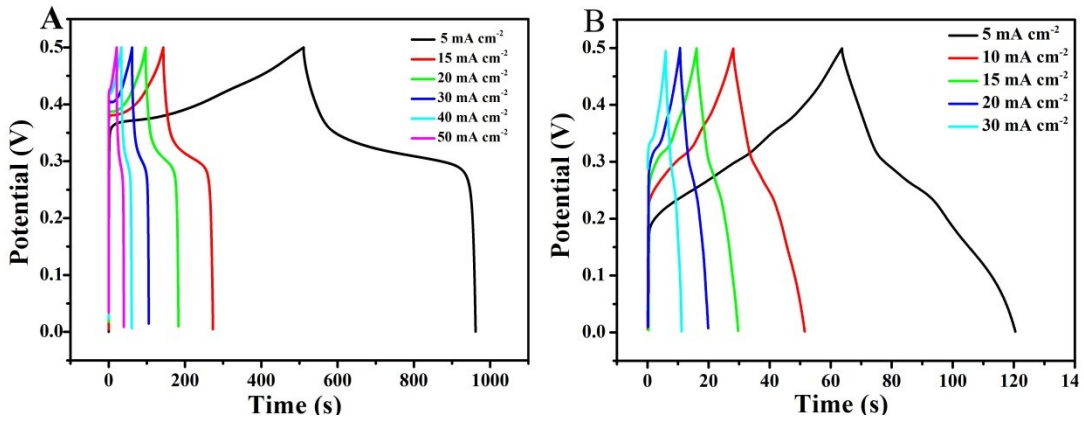

Figure S7 (A) GCD curves at different current densities of Ni-P and NiCo LDH samples

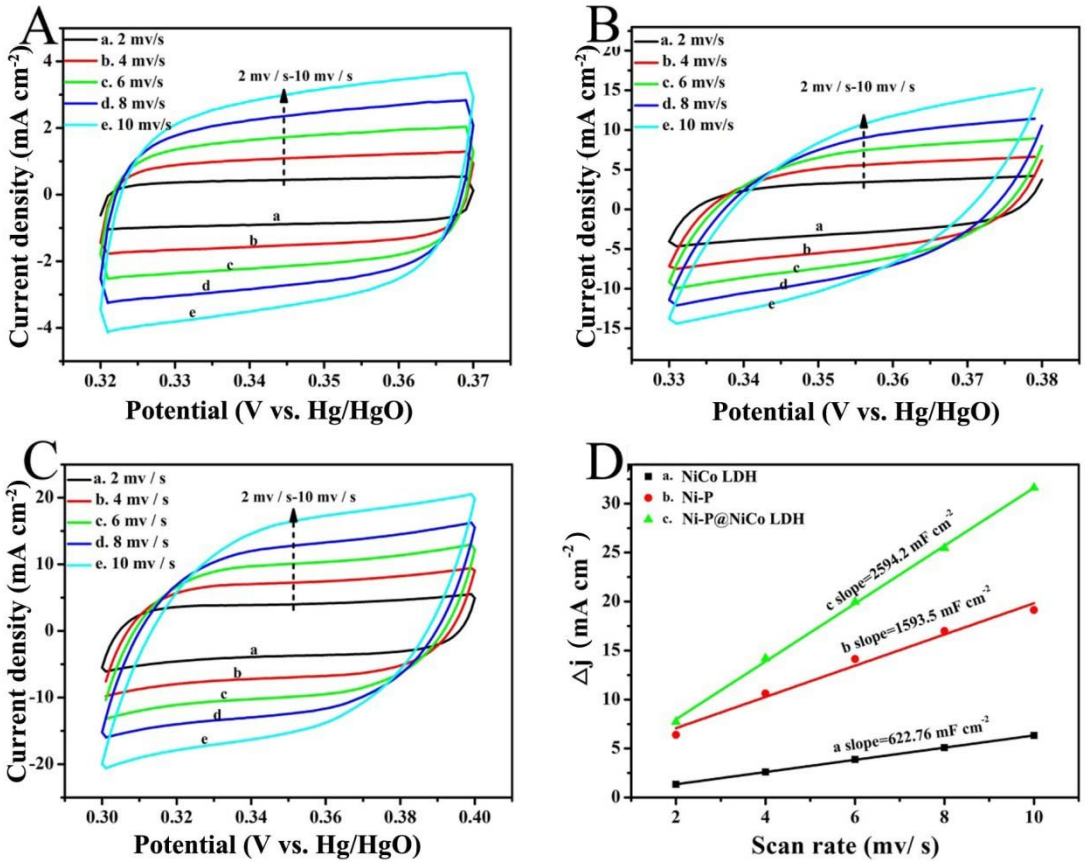

Figure S9 CVs curves of NiCo LDH (A), Ni-P (B) and Ni-P@NiCo LDH (C) and (D) Plots of the current density *vs.* scan rate of these samples

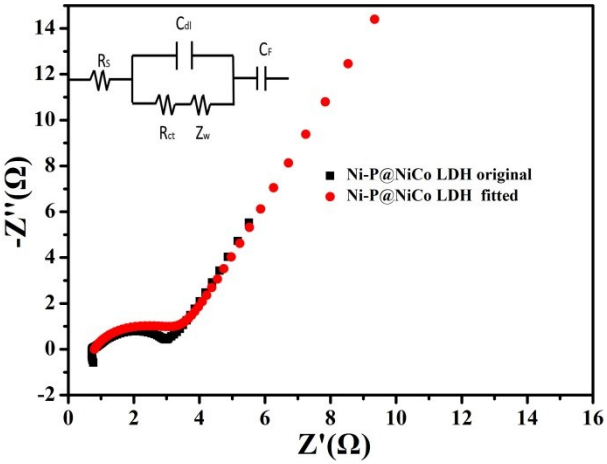

Figure S10 Original and fitted EIS plots of Ni-P@NiCo LDH

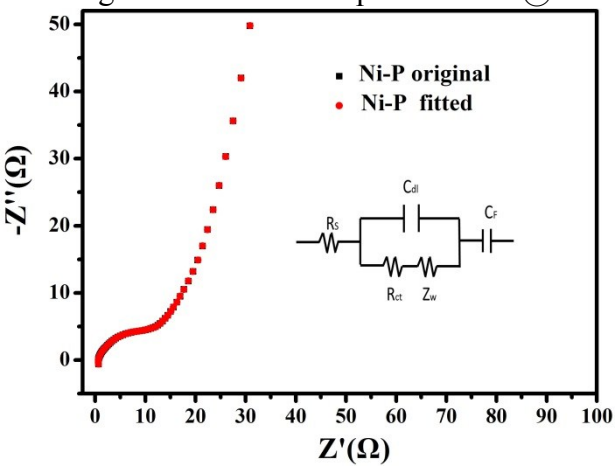

Figure S11 Original and fitted EIS plots of Ni-P

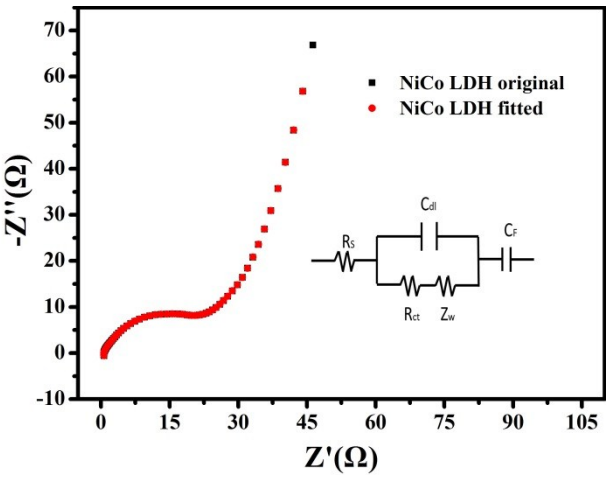

Figure S12 Original and fitted EIS plots of NiCo LDH

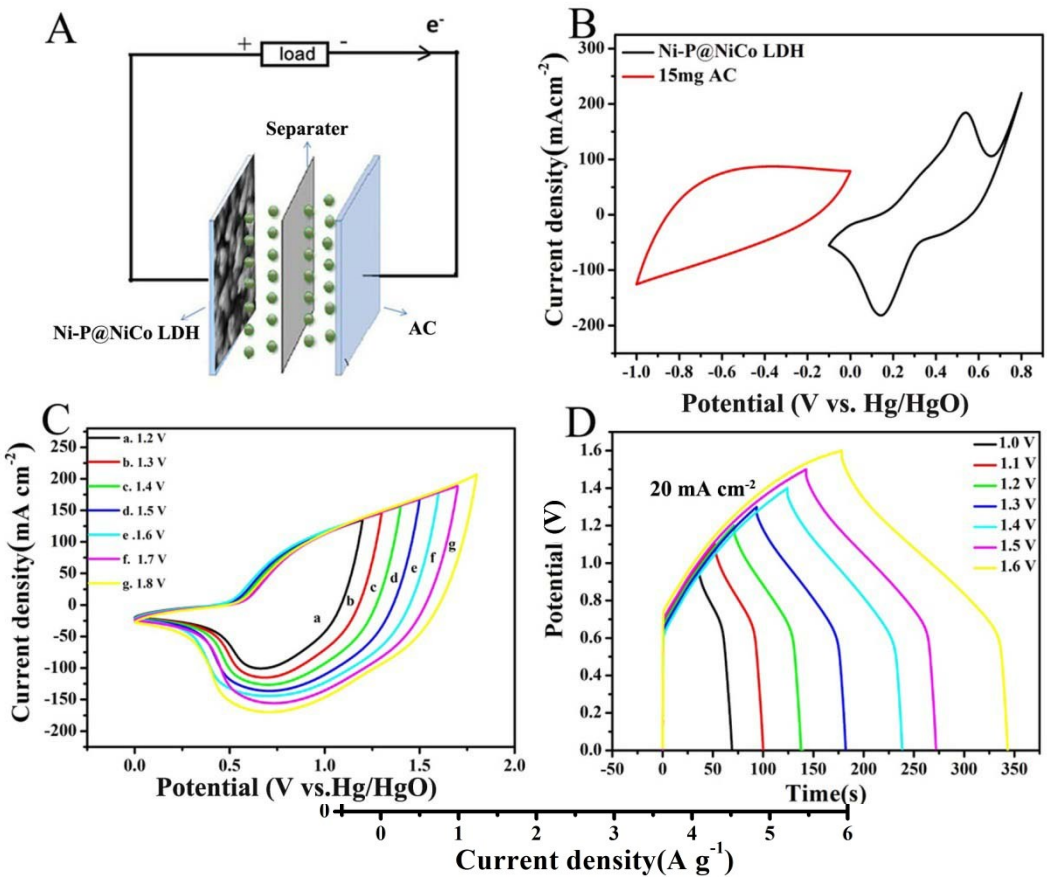

Figure S14 Mass specific capacitances of Ni-P@NiCo LDH //AC ASCs at different current densities

Table S1 Comparison of electrochemical performance of Ni-P@NiCo LDH electrode with some representative hierarchical nanostructures

Hierarchical nanostructures	Mass loading (mg cm^{-2})	Specific capacitance	Stability	Ref.
NiP@CoAl-LDH NTAs	0.9	0.26 F cm^{-2} at 1 mA cm^{-2}	95.50% 4000 cycles	1
$CoS@NiCo_2S_4$	2.35	7.62 F cm^{-2} at 5 mA cm^{-2}	71.7% 3000 cycles	2
Co_3O_4@Au	-	6.39 F cm^{-2} at 5 mA cm^{-2}	78% 2000 cycles	3
$Co_3O_4@NiMoO_4$	5.2	5.69 F cm^{-2} at 30 mA cm^{-2}	84% 3000 cycles	4
$Co_3O_4@NiCo_2O_4$	1.5	2.04 F cm^{-2} at 5 mV s^{-1}	83.7% 1500 cycles	5
$NiCo_2S_4$@PPy	6.87	9.781 F cm^{-2} at 5 mA cm^{-2}	80.64% 2500 cycles	6
$ZnO@C@NiCo_2O_4$	3.0	3.18 F cm^{-2} at 6 mA cm^{-2}	76% 4000 cycles	7
$ZnO@MnO_2$	5.7	5.2 F cm^{-2} at 0.36 mA cm^{-2}	95% 5000	8
This work	2.74	12.9 F cm^{-2} at 5 mA cm^{-2}	96% 10000 cycles	

References

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