

## **March 25 2015 Polymer Subcommittee Meeting Minutes**

Lizhi Liu, Chairman

Tom Blanton – Secretary / ICDD Staff Liaison

Lizhi Liu opened the meeting.

Attendance list is on record at headquarters.

There were no minutes from the 2014 meeting, so there were none to approve.

Tom Blanton presented an ICDD report:

There were no motions from last year (2014).

Polymer entries for the ICDD PDF releases for 2015 were discussed. The list of polymers is attached.

For the 2015-2016 fiscal year, ICDD will work on targeted pharmaceutical and medical device polymers for inclusion in future PDF databases. The list of polymers of interest is attached. Many are represented in the database as d/I patterns, a smaller number have PD3 raw data patterns as part of the database entry.

ICDD is planning on a Polymer Workshop in October 2015. The principal instructors will be Sanjeeva Murthy and Brian Landes. ICDD instructors will be Stacy Gates, Tim Fawcett, and Tom Blanton. ICDD Conference Services will be working on the logistics and operation of the workshop.

Lizhi Liu gave a presentation on 2D diffraction analysis of polymers.

Lizhi and Bob He have drafted a 2D XRD technical paper tutorial focusing on polymer materials. Lizhi will continue to work on the tutorial, and ask for reviewers for input. When the draft is complete, it will be provided to ICDD for additional reviews.

A suggestion was made asking for a PowerPoint presentation to be generated from the technical paper. The intention is to add the presentation as a supplement to the technical paper. Both the paper and presentation would be available on the ICDD web page.

There were no additional items for discussion. The meeting was adjourned.

Polymers in the 2015 ICDD PDF databases, Set 00 experimental data:

00-065-0770	O	(( C H3 ( C H2 )5 )2 C6 H6 ( ( C H2 ...	(9E)-10-(2-(7-Carboxyheptyl)-5,6-dihexylcyclohex-3-en-1-yl)dec-9-enoic acidethane-1,2-diamine(1:1)
00-065-0771	O	(( C H3 ( C H2 )5 )2 C6 H6 ( ( C H2 ...	(9E)-10-(2-(7-Carboxyheptyl)-5,6-dihexylcyclohex-3-en-1-yl)dec-9-enoic acidhexane-1,2-diamine(1:1)
00-065-0772	O	(( C H3 ( C H2 )5 )2 C6 H6 ( ( C H2 ...	(9E)-10-(2-(7-Carboxyheptyl)-5,6-dihexylcyclohex-3-en-1-yl)dec-9-enoic acid-octane-1,2-diamine(1:1)
00-065-0776	B	( C8 H8 )n · ( C H Cl3 )x	Poly(phenylethane) trichloromethane
00-065-0810	B	( C H2 )5 O C O N H	5-PUR
00-065-0811	B	( C H2 )6 O C O N H	6-PUR
00-065-0812	B	( C H2 )7 O C O N H	7-PUR
00-065-0813	B	( C H2 )8 O C O N H	8-PUR
00-065-0814	B	( C H2 )9 O C O N H	9-PUR
00-065-0815	I	( C H2 )10 O C O N H	10-PUR
00-065-0816	B	( C H2 )11 O C O N H	11-PUR
00-065-0817	I	( C H2 )12 O C O N H	12-PUR
00-065-0822	O	( C6 H2 ( C H3 )2 O )n	Poly(2,6-dimethyl-4-oxidophenyl)
00-065-0823	O	( C6 H2 ( C H3 )2 O )n	Poly(2,6-dimethyl-4-oxidophenyl)
00-065-0824	O	( C6 H2 ( C H3 )2 O )n	Poly(2,6-dimethyl-4-oxidophenyl)
00-065-0826	O	( C6 H4 ( N H ) )n	Polyaniline
00-065-0827	O	( C6 H4 ( N H ) )n	Polyaniline
00-065-0828	O	( C6 H4 ( N H ) )n	Polyaniline
00-065-0832	S	( Cu ( O2 C C H3 )4 Cu ( O C C H3 ...	Poly( 3,7,10,13-tetramethyl-1,5-dicupera-2,4,6,8,9,11,12,14-octaooxatricyclo(3.3.3.3(1,5))tetradecane bis(triethylammonium ethanoate-O) ethanonitrile)
00-065-0890	S	( C8 H13 O5 N )n	Poly-glucosamine
00-065-1527	G	( C44 H22 N2 F6 O4 )0.75 ( C34 H1...	Copolyimide based on 4,4'-(hexafluoroisopropylidene)diphthalcanhydride, 4,4'-bis(4-aminophenyl)fluorene and 4,4'-(hexafluoroisopropylidene)dianiline
00-065-1529	M	(( C F2 C F2 )x ( C F2 C F ) )n ( O ...	Nafion PFSA
00-065-1530	M	(( C F2 C F2 )x ( C F2 C F ) )n ( O ...	Nafion PFSA
00-065-1531	M	(( C F2 C F2 )x ( C F2 C F ) )n ( O ...	Nafion PFSA

Targeted pharmaceutical polymers – 2015:

Polymer	Mol. Formula	PDF Entry	PD3
poly(acrylic acid), PAA	(C <sub>3</sub> H <sub>4</sub> O <sub>2</sub> ) <sub>n</sub>	N	N
poly(ethylene oxide), PEO	(C <sub>2</sub> H <sub>4</sub> O) <sub>n</sub>	Y	N
poly(ethylene glycol), PEG	(C <sub>2</sub> H <sub>4</sub> O) <sub>n</sub>	Y	N
poly(vinyl pyrrolidone), PVP	(C <sub>6</sub> H <sub>9</sub> NO) <sub>n</sub>	N	N
poly(vinyl alcohol), PVOH, PVA	(C <sub>2</sub> H <sub>4</sub> O) <sub>n</sub>	Y	Y
polyacrylamide, PAM	(C <sub>3</sub> H <sub>5</sub> NO) <sub>n</sub>	N	N
poly(N-isopropylacrylamide)	(C <sub>6</sub> H <sub>11</sub> NO) <sub>n</sub>	N	N
poly(N-cyclopropyl methacrylamide)		N	N
ethyl cellulose	((C <sub>6</sub> H <sub>8</sub> O <sub>5</sub> (C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> ) <sub>n</sub>	N	N
carboxymethyl cellulose	(C <sub>6</sub> H <sub>7</sub> O <sub>5</sub> R <sub>1, 2, or 3</sub> ) <sub>n</sub> R=H or CH <sub>2</sub> CO <sub>2</sub> H	N	N
hydroxyethyl cellulose	(C <sub>6</sub> H <sub>7</sub> O <sub>5</sub> R <sub>1, 2, or 3</sub> ) <sub>n</sub> R=H or CH <sub>2</sub> CH <sub>2</sub> OH	N	N
hydroxypropyl cellulose	(C <sub>6</sub> H <sub>7</sub> O <sub>5</sub> R <sub>1,2, or 3</sub> ) <sub>n</sub> R=H or CH <sub>2</sub> CH(OH)CH <sub>3</sub>	N	N
hydroxypropyl methyl cellulose, HPMC	(C <sub>6</sub> H <sub>7</sub> O <sub>5</sub> R <sub>1,2, or 3</sub> ) <sub>n</sub> R=H or CH <sub>3</sub> or CH <sub>2</sub> CH(OH)CH <sub>3</sub>	N	N
cellulose acetate phthalate	(C <sub>6</sub> H <sub>7</sub> O <sub>5</sub> R <sub>1,2, or 3</sub> ) <sub>n</sub> R=H or CH <sub>3</sub> CO or C <sub>6</sub> H <sub>4</sub> COCO <sub>2</sub> H	Y	Y
alginate	(C <sub>6</sub> H <sub>8</sub> O <sub>6</sub> ) <sub>n</sub>	N	N
carrageenan		N	N
chitosan	(C <sub>6</sub> H <sub>11</sub> O <sub>4</sub> N) <sub>n</sub>	Y	N
hyaluronic acid	(C <sub>14</sub> H <sub>21</sub> NO <sub>11</sub> ) <sub>n</sub>	N	N
pectinic acid	(C <sub>13</sub> H <sub>14</sub> O <sub>13</sub> ) <sub>n</sub>	N	N
poly(lactide-co-glycolic acid, PLGA)	(C <sub>3</sub> H <sub>4</sub> O <sub>2</sub> ) <sub>m</sub> (C <sub>2</sub> H <sub>2</sub> O <sub>2</sub> ) <sub>n</sub>	N	N
starch	(C <sub>6</sub> H <sub>10</sub> O <sub>5</sub> ) <sub>n</sub>	Y	N
sodium starch glycolate	(C <sub>2</sub> H <sub>4</sub> O <sub>3</sub> Na) <sub>n</sub>	N	N
Dextran	H(C <sub>6</sub> H <sub>10</sub> O <sub>5</sub> ) <sub>n</sub> OH	Y	Y
Xanthum Gum	C <sub>35</sub> H <sub>49</sub> O <sub>29</sub> (monomer)	N	N
Gelatin	(C <sub>35</sub> H <sub>55</sub> N <sub>12</sub> O <sub>12</sub> ) <sub>n</sub>	Y	Y

Targeted medical device polymers – 2015:

Polymer	Mol. Formula	PDF Entry	PD3
polyurethane, PU	(R-NHCO <sub>2</sub> ) <sub>n</sub>	Y	N
silicone	(OSiR <sub>2</sub> ) <sub>n</sub>	Y	N
polycarbonate, PC	(ROCO <sub>2</sub> ) <sub>n</sub>	Y	Y
polychloroprene	(C <sub>4</sub> H <sub>5</sub> Cl) <sub>n</sub>	Y	N
polyisobutylene, PIB	(CH <sub>2</sub> C(CH <sub>3</sub> ) <sub>2</sub> ) <sub>n</sub>	Y	N
polycyanoacrylate	(C <sub>5</sub> H <sub>5</sub> O <sub>2</sub> N) <sub>n</sub>	N	N
poly(vinyl acetate), PVAc	(C <sub>4</sub> H <sub>6</sub> O <sub>2</sub> ) <sub>n</sub>	N	N
polystyrene, PS atactic	(C <sub>8</sub> H <sub>8</sub> ) <sub>n</sub>	Y	Y
polystyrene, PS isotactic	(C <sub>8</sub> H <sub>8</sub> ) <sub>n</sub>	Y	N
polypropylene, PP	(C <sub>3</sub> H <sub>6</sub> ) <sub>n</sub>	Y	Y
poly(vinyl chloride), PVC	(C <sub>2</sub> H <sub>3</sub> Cl) <sub>n</sub>	Y	Y
polyethylene	(C <sub>2</sub> H <sub>4</sub> ) <sub>n</sub>	Y	Y
poly (methyl methacrylate)	(C <sub>5</sub> H <sub>8</sub> O <sub>2</sub> ) <sub>n</sub>	Y	N
poly(hydroxyethyl methacrylate)	(C <sub>6</sub> H <sub>10</sub> O <sub>3</sub> ) <sub>n</sub>	N	N
poly(N-butyl acrylate-co-acrylic acid)		N	N
2-ethylhexyl acrylate and butyl acrylate copolymer		N	N
vinyl acetate and methyl acrylate copolymer		N	N
Ethylene vinyl acetate, EVA	(C <sub>2</sub> H <sub>4</sub> ) <sub>m</sub> (C <sub>4</sub> H <sub>6</sub> O <sub>2</sub> ) <sub>n</sub>	Y	Y
poly(ethylene terephthalate, PET	(C <sub>10</sub> H <sub>8</sub> O <sub>4</sub> ) <sub>n</sub>	Y	Y