

[14:43] <Doos> okay last week we did fingerprints I believe  
[14:43] <TNPearl\_> yep  
[14:43] <Frank> yes  
[14:43] <Doos> any questions sofar on that or anything  
[14:43] <Frank> no  
[14:43] <africanuck> no  
[14:44] <Cattrix> no  
[14:44] <Doos> you have any questions on that Annie?  
[14:44] <Doos> :)  
[14:44] <Annie> :-)  
[14:44] <Doos> all was clear to you what you explained?  
[14:45] <Doos> today twinning and colour zones  
[14:45] <Cattrix> goody!  
[14:45] <Doos> you want to start Annie?  
[14:45] <Doos> or shall I do some theory first?  
[14:46] <Annie> you can start doos.  
[14:46] <Doos> do you all have an idea how twinning happens?  
[14:47] <africanuck> two crystals growing in the same space  
[14:47] <Doos> yes that is it basically  
[14:48] <Doos> there are about 3 ways why it happens  
[14:49] <Doos> but it's all sharing space  
[14:49] <Doos> and it will show internally in the gem  
[14:50] <Doos> the main reasons are: two minerals sharing a boundary and  
going their seperate ways  
[14:51] <Doos> or, under high pressure/temperature the crystal lattice  
develops differently  
[14:51] <Doos> or they get deformed by pressure  
[14:52] <Doos> twinning in corundum can be a very diagnostic feature  
[14:53] <africanuck> presumably, it doesn't happen in synthetics?  
[14:53] <Doos> brb, terrible potty urgency  
[14:53] <Frank> Yes it does  
[14:54] <Frank> On the new synth course RJ talks about revolving the seed  
crystals making structural lines that he says a twinning lines  
[14:54] <africanuck> hmmm, will have to go back and read that one again  
[14:55] <Doos> yes it happens in synthetics aswell  
[14:55] <africanuck> ok, then it is diagnostic of what?  
[14:56] <Frank> Canuck I think it used to be diagnostic for amethyst but  
not any more  
[14:56] <Doos> well, natural and some synthetics grow in the  
triganoal/hexagonal form  
[14:56] <Doos> they follow the lattice along certain faces  
[14:57] Annie (~Annie@203.61.89.37) left #yg.  
[14:57] <Doos> usually corundum shows twinning around 40-50 degrees to  
the c-axis  
[14:58] <Doos> and as most corundum is cut with the table perpendicular  
to the c-axis, that can give an important clue  
[14:58] <Frank> Canuck...chapter 12 paragraph 5  
[14:58] <africanuck> thanks Frank, will note that down  
[14:59] <Doos> shall we wait for annie?  
[14:59] <africanuck> she must have been fiddling with firefox  
[15:00] <Frank> Sorry paragraph 5 of the hydrothermal section.....Sorry  
doos...  
[15:01] <Doos> wait a bit?  
[15:01] <Frank> as u please  
[15:01] <hehheh> ?  
[15:01] <hehheh> what are you guys referencing?  
[15:01] <Doos> the ISG hehheh  
[15:01] <Frank> as you please....answer to doos shall we wait question

[15:03] <Doos> we'll go on, hopefully she's back in time to do some practicals  
[15:03] <Frank> ok  
[15:03] <Doos> usually twin planes in corundum is accompanied with needle inclusions  
[15:04] <Frank> do they follow the twinning planes?  
[15:04] <Doos> most synthetics do not, except Verneuil synthetics  
[15:04] <Doos> yes at the intersections  
[15:04] <Frank> so these are at 40 - 50 degrees?  
[15:04] <hehheh> Did RJ change the passwords? I can't seem to enter the pearls and the synthetics  
[15:05] <Frank> The synthetics isn't online yet  
[15:05] <hehheh> oh  
[15:05] <Frank> canuck and I have been proofreading  
[15:05] <Doos> wan't me to look up the exact degrees?  
[15:05] <Frank> so got an early peep  
[15:05] <hehheh> how was it?  
[15:05] <africanuck> awesome  
[15:05] <Frank> Is it always exactly the same?  
[15:05] <Doos> pretty good  
[15:06] <Frank> Every pictures worth a thousand words heh  
[15:06] <Doos> yes Frank, but they can also occur on other faces  
[15:06] <hehheh> does it cover synthetic alexandrites?  
[15:06] <Doos> yes hehheh  
[15:06] <hehheh> chatham alexandrite and czochralski  
[15:06] <Frank> yes  
[15:06] <africanuck> yes, it does  
[15:06] <hehheh> Identification procedures for clean at 20x for synthetic alexes?  
[15:07] <Frank> diagnostic is difficult / impossible for pulled  
[15:07] <hehheh> I am running into problems with loupe clean alexes recently  
[15:07] <Frank> easy for chatham  
[15:07] <Frank> If they are clean they are probably pulled  
[15:07] <Doos> "too good to be true" is a phrase you should always have in the back of your mind  
[15:07] Annie (~Annie@203.61.88.192) joined #yg.  
[15:08] <hehheh> i wrote to chatham, they said they have clean at 20x stones  
[15:08] <Doos> wb Annie  
[15:08] <Frank> wb Annie  
[15:08] <Annie> wooo  
[15:08] <Catrix> rehi Annie  
[15:08] <Annie> gosh that was long  
[15:08] <hehheh> and they want to charge me 500/ct  
[15:08] <TNPearl\_> wb annie  
[15:08] <Annie> thanks lovies  
[15:08] <hehheh> and I thought, WOAHA, I'd be crazy buying that  
[15:08] <Frank> yes..RJ says the normal ones are 140/ct  
[15:09] <Frank> 150/ct ..typo  
[15:09] <hehheh> anyway, let's get back to twinning  
[15:09] <Frank> Ok back to corundum  
[15:09] <hehheh> which part of ISG are you guys referencing?  
[15:09] <Doos> okay, verneuil can also show the boehmite needles as in natural  
[15:10] <Doos> and also show twinning along the same faces  
[15:10] <hehheh> the needles can be limenite too right?

[15:10] <Doos> but virtually all verneuil's are cut with the table parallel to the c-axis  
[15:10] Annie (~Annie@203.61.88.192) left irc: Read error: Connection reset by peer  
[15:11] <Doos> ilmenite is usually not associated with twinning planes  
[15:11] <hehheh> ah  
[15:11] <Frank> How would I know if the cut was along or perpendicular to the c axis?  
[15:12] Annie (~Annie@203.61.88.192) joined #yg.  
[15:12] <Annie> hello  
[15:12] <Frank> hhi  
[15:12] <Annie> Doos, are you doing anything  
[15:12] <Doos> Frank, as Ars once explained .. naturals are usually cut that way  
[15:12] <Cattrix> hu  
[15:13] <Doos> for maximum colour  
[15:13] <Frank> yes but would I be able to say which just by orientation of the needles?  
[15:13] <Doos> yes  
[15:13] <Frank> which is which?  
[15:13] <Doos> if you have a natural it will show at about 45 degrees to the table  
[15:14] <Annie> sorry, but its continually saying that 'crashing is detected' now,  
[15:14] <Frank> try internet explorer annie  
[15:14] <Doos> synthetics at 45 degrees to the girdle  
[15:14] <Doos> in firefox Annie?  
[15:14] <Annie> yep  
[15:15] <Doos> fingers crossed  
[15:15] <hehheh> is this diagnostic  
[15:15] Annie (~Annie@203.61.88.192) left #yg.  
[15:16] <Doos> well when you find the needles and the planes, I would say it is  
[15:16] <Doos> or atleast a strong clue  
[15:16] <hehheh> how did the boehmite crystals appear in the verneuil stones?  
[15:16] <Doos> good question  
[15:17] <Frank> I understand the 45 degrees to the girdle line...but 45 degrees from the table?...which direction  
[15:17] <Doos> probable in the mixture  
[15:17] <hehheh> intentional addition?  
[15:17] <Doos> dunno hehheh  
[15:17] <Doos> Frank, well naturals are cut with the table to the c-axis  
[15:17] <hehheh> then how did twinning take place in the boule?  
[15:18] <Doos> verneuils are cut with the table parallel to the c-axis .. so a 90 degree turn  
[15:19] <Doos> due to heat I would imagine hehheh  
[15:19] <Frank> I understand that but I'm wondering what reference your using to state 45 degrees from the table  
[15:19] <Doos> not exactly 45 degrees  
[15:20] <Doos> they are the rhombohedron faces  
[15:20] <Doos> 32.4/51.8  
[15:21] <Doos> those are the exact angles  
[15:21] <Frank> Ah...ok now I've caught on / up  
[15:21] <hehheh> what are those numbers?  
[15:21] <Doos> the angles to the c-axis  
[15:21] <hehheh> okay  
[15:21] <Doos> so I rounded it to 45 degrees

[15:22] <Frank> are the numbers a range?  
[15:22] <Doos> no, exact angles, one side 32.4, the other 51.8  
[15:22] <Frank> Ok  
[15:22] <Frank> both from the c-axis  
[15:22] <Doos> yes  
[15:23] <Frank> Ok ..Clear  
[15:23] <Doos> best way to see the twinning planes are under magnification (microscope) while using crossed polars  
[15:23] <Doos> so a polariscope  
[15:24] <Doos> that will show a nice colour display of the twin plane  
[15:24] <Frank> Does it show up as multicolour?  
[15:25] <Doos> yes like interference figure colours  
[15:25] <Frank> ok  
[15:25] <Doos> Annie will have to handle the rest, not my best topic  
[15:26] <africanuck> annie isn't online  
[15:26] <Doos> I know  
[15:26] <Doos> that's why I'm sweating  
[15:26] <Doos> :)  
[15:26] <africanuck> lol  
[15:26] <Frank> How common is twinning in corundum...lol....your doing well  
[15:26] <Doos> pretty common  
[15:27] <africanuck> more from one locality than another?  
[15:27] <africanuck> or pretty much even across the board  
[15:27] <Doos> twinning can also occur on different faces, but that is not common  
[15:28] <Doos> from most resources that I know  
[15:28] <Doos> shall I do a little on zoning?  
[15:28] <africanuck> is it more common in sapphires or rubies...or about the same?  
[15:28] <Frank> yes  
[15:29] Annie (~Annie@203.61.88.38) joined #yg.  
[15:29] <TNPearl\_> for us newbies could you break down the needles on natural and syn a little more  
[15:29] <TNPearl\_> ok later  
[15:29] <africanuck> annie, are you now using internet explorer?  
[15:29] <Annie> hi  
[15:29] <Cattrix> rehi Annie  
[15:29] <Annie> yeeh, i am now logged on yg  
[15:30] <Annie> i think i messed up again  
[15:30] <Doos> Annie, I talked a bit on twinning in naturals and boehmite .. since that is not my best topic, could you have a go at it?  
[15:31] <Doos> I didn't cover plato  
[15:31] <Annie> doos, please continue, i may not be able to stay.. although i am stressed over al this  
[15:31] <Doos> nah, you need to step in for a bt  
[15:31] <Doos> just aslong as you are here  
[15:32] <Annie> well, i can't seem to stay  
[15:32] <Doos> try  
[15:32] <Annie> i gota a bloody headacke from it all  
[15:32] <Doos> just start and when you get out, I'll continue  
[15:32] <Annie> :(  
[15:32] <Cattrix> comfort Annie  
[15:34] <Doos> okay, I'll start zoning  
[15:34] <Doos> zoning is the same thing as what happens to tree rings  
[15:34] <Doos> the aging rings  
[15:35] <Doos> while a crystal grows, more of the surrounding minerals start to crystallize against the sides of the crystal

[15:35] <Doos> making it grow  
[15:35] Annie (~Annie@203.61.88.38) left #yg.  
[15:36] <Doos> that is a process everyone can imagine I suppose  
[15:36] <Frank> yes  
[15:37] <Doos> what happens is that sometimes the surrounding minerals who get deposited on the mineral are not always the same  
[15:38] <Doos> and as corundum has no colour by itself, it needs let's say iron in the surrounding mass to make it blue  
[15:39] <Doos> whne there is a lack of trace elements in the surrounding mass, it will deposit a colourless rim  
[15:39] <Doos> so like a tree, it will show up blue/white/blue/white etc  
[15:39] <Doos> those blue/white areas is what is called zoning  
[15:40] <Doos> you can not see it easily  
[15:40] Nick change: gemma-brb -> gemma  
[15:40] Cattrix (~Cattrix@172.197.176.54) left #yg.  
[15:41] <Doos> the best way to see them is under crossed polars again, but then also immersed in liquid  
[15:41] <Doos> cat excused herself, not feeling well  
[15:41] <Doos> hey gemma  
[15:41] <Frank> and the zoning meets at 60 degree angles  
[15:41] hehheh (~hehheh@202.156.240.5) left irc: Quit: Trillian (<http://www.ceruleanstudios.com>)  
[15:42] <gemma> hey frank  
[15:42] <gemma> doos xsorry  
[15:42] <Doos> yes frank, in natural corundum it follows the crystal faces exactly  
[15:42] hehheh (~hehheh@202.156.240.5) joined #yg.  
[15:42] <Doos> so, 60/120 degrees  
[15:42] <Frank> Hi gemma....hugs  
[15:42] <africanuck> hi gemma  
[15:42] <Doos> but also at 90 degrees, parallel to the c-axis  
[15:42] <Frank> is there adifference between growth and colour zones?  
[15:43] <Doos> in terminology?  
[15:43] <TNPearl\_> hi gamma  
[15:43] <africanuck> you say "in natural corundum", so it also exists in synthetics too?  
[15:43] <Doos> yes africanuck  
[15:44] <Frank> yes...the fga label them seperately but it's a b & w diagram so it's not clear if it's a thinner line or if there is any difference at all  
[15:44] <Doos> the flux and hydrothermal ones also show the sharp colour zones  
[15:44] <Doos> or growth zones  
[15:44] <Doos> same thing Frank  
[15:44] <Frank> Ok  
[15:44] <Doos> to the best of my knowlegde ofcourse  
[15:45] <Frank> accepted  
[15:45] Jen\_ (~Jen@66.244.234.131) joined #yg.  
[15:45] <Doos> hi jen  
[15:45] <Frank> hi Jen  
[15:45] <africanuck> hi jen  
[15:45] <Jen\_> hi  
[15:45] <TNPearl\_> hi jen  
[15:45] <africanuck> ok, but the color zoning in flux or hydrothermal wouldn't be at the same angles?  
[15:46] <Frank> It would if they use seed crystals  
[15:46] <Doos> so only natural corundum and hydro/flux synthetics show the sharp zoning edges that follow the hexagonal/trigonal structure

[15:46] <Doos> indeed africanuck  
[15:46] <Frank> the new growth should follow the existinf lattice  
[15:46] <Doos> there is only one exception and that is a russian type flux  
[15:47] <Doos> verneuil will show the typical curved bands  
[15:48] <Doos> the rest is upto angle measurement with a special eyepiece in the microscope  
[15:49] <Doos> did I mention immersion liquid to make it visible?  
[15:49] <Frank> yes  
[15:50] <Doos> sometimes it's very easy to spot, but not always, that is where the liquid comes in  
[15:50] <Doos> that is about abot zoning, not a long topic  
[15:51] <Frank> What has plato got to do with it all?  
[15:51] <Doos> plato lines are twinning lines  
[15:51] <Frank> ah...ok....  
[15:52] <Doos> you see that more frequent in plagiclase  
[15:52] <africanuck> ok, at one point a couple of chats ago, someone mentioned lamellar twinning  
[15:52] <Doos> it's a type of layering  
[15:52] <Doos> that is it  
[15:52] <Frank> is there a difference between lamellar twinning and other types or is it just terminology?  
[15:52] <africanuck> that was my question  
[15:52] <Frank> lol...too slow  
[15:52] <Doos> heh  
[15:53] <africanuck> i warmed it up for u  
[15:53] <africanuck> lol  
[15:53] <Frank> lol  
[15:53] <Doos> lammelar twinning is the same as polysynthetic twinning, they show plato lines  
[15:53] <Frank> and that is a type of layering  
[15:53] <africanuck> btw, I just posted that website with the photos that I promised to do last week and forgot  
[15:54] <Doos> the "plato lines" is only a term they use to make it visable in immersion liquid  
[15:55] <Doos> in corundum it means it probably is a verneuil  
[15:55] <africanuck> ok, this has nothing to do with corundum, but would watermelon tourmaline be a form of zoning as well? Just with different minerals in the mix  
[15:55] <Doos> yes it is africanuck  
[15:56] <africanuck> so, do they ever find the same sort of effect in corundum?  
[15:56] <Doos> I forgot the details behind it  
[15:56] <africanuck> one color inside, another outside  
[15:56] <Doos> would be the first I heard of  
[15:57] <Doos> I forgot the details in Tourmaline, Tourmaline is very complex  
[15:57] <africanuck> RJ had a photo of an emerald like that, emerald...beryl...emerald  
[15:57] <Frank> Good question though canuck...red ruby with blue heart...should just be a change of trace minerals  
[15:57] <Frank> The trapiche?  
[15:57] <Doos> yes internally that happens indeed Frank  
[15:58] <africanuck> yes, but one that was like a flower  
[15:58] <Frank> The clear bits aren't beryl though...aren't they feldspar or something  
[15:58] <Doos> the blue core gets heated away later to let a more red show

[15:58] <africanuck> not that one Franck, let me find it  
[15:59] <Frank> so bicoloured stones just get heated to single colour stones?  
[16:00] <Doos> yes, but they are not bi-coloured like the tourmalines  
[16:00] <Frank> no I understand that  
[16:00] <gemma> i don't.  
[16:00] <africanuck> frank, under the 60 days of gemstones, emerald  
[16:00] <Doos> I forgot how that works, but I believe it had to do that different family members combine in tourmaline  
[16:01] <gemma> ok. that is correct from something i remember now reading before.  
[16:02] <gemma> which is why tourmaline is such a bugger and so facsinating  
[16:02] <Doos> yah, very complex series  
[16:02] <Frank> Ah yes.....nice eh canuck  
[16:02] <africanuck> very nice  
[16:03] <Jen\_> ok guys and girls i am heading off talk to you later, bye  
[16:03] <africanuck> see you later Jen  
[16:03] <Doos> pearl you had a question on the needles?  
[16:03] <TNPearl\_> bye jen  
[16:03] <Doos> bye jen  
[16:03] <TNPearl\_> later  
[16:03] Jen\_ (~Jen@66.244.234.131) left #yg.  
[16:03] <gemma> i have one too TN. maybe the same  
[16:03] <Frank> bye jen  
[16:03] <TNPearl\_> you go ahead  
[16:04] <gemma> (gulp)  
[16:04] <TNPearl\_> lol  
[16:04] <gemma> frank was talking about knowing what axis the needles ran  
[16:04] <gemma> do you mean they always grow parallel to the c axis?  
[16:04] <TNPearl\_> thats it  
[16:04] <gemma> in corundum?  
[16:04] <gemma> :)  
[16:05] <Doos> they can  
[16:05] <gemma> can?  
[16:05] <gemma> :(  
[16:05] <Doos> usually rutile needles form perpendicular to the c-axis  
[16:05] <Doos> ilmenite parallel  
[16:05] <Doos> I believe  
[16:05] <gemma> oh is guess i got that backwards.  
[16:06] <gemma> then are the axis/inclusions diagnostic for location?  
[16:06] <Doos> the boehmite at an odd angle  
[16:06] <gemma> then it's not as neat and tidy as i had hoped.  
[16:06] <Frank> on a twin crystal the needles are at 32.4 and 51.8 degrees from the c axis...is that right?  
[16:06] <Doos> that is caused by twinning  
[16:07] <Frank> yes ok ty  
[16:07] <Doos> yes frank  
[16:07] <gemma> but you can tell it's twinned, correct?  
[16:07] <Doos> yes gemma  
[16:07] <gemma> whew  
[16:07] <Doos> oh something else  
[16:08] <TNPearl\_> yes  
[16:08] <Doos> remember waaaay back we had a discussion on open and closed crystal forms?  
[16:08] <gemma> do i ever.  
[16:08] <Frank> lol.....one of our best

[16:08] <Doos> I read something interesting that might clarify that once and for all  
[16:08] <africanuck> do tell  
[16:08] <Frank> what  
[16:08] <Doos> wanna know?  
[16:09] <TNPearl\_> yes  
[16:09] <Frank> grrrrr  
[16:09] <Doos> how bad do you wanna know?  
[16:09] <Frank> GRRRRRRRRRR  
[16:09] <TNPearl\_> DOOS  
[16:09] <gemma> you can borrow my cat woman suit  
[16:09] <Doos> heh  
[16:09] <Doos> let's take a cube  
[16:09] <Doos> it has 6 faces or planes  
[16:09] <TNPearl\_> k  
[16:10] <Doos> if you take one face, you can place it on any other face and it will fit perfectly  
[16:10] <Doos> that is closed  
[16:10] <africanuck> yes  
[16:10] <Doos> same with the octahedron  
[16:10] <Doos> you can grab any plane and it will fit on all others  
[16:11] <Doos> in a prism you can't do that  
[16:11] <Doos> the top face will not fit on the sides  
[16:11] <Doos> so it's open  
[16:11] <gemma> well now i feel vindicated. in the first RIP forum, that is a question i posed and got tromped.  
[16:11] <gemma> so. where did you read this doos  
[16:12] <gemma> chapter and verse please  
[16:12] <TNPearl\_> ?  
[16:12] <Doos> webster  
[16:12] <Frank> gemma stands tapping her foot impatiently  
[16:12] <gemma> gotta love him  
[16:12] <Doos> 4th edition  
[16:12] <gemma> page page page  
[16:12] <Frank> lol  
[16:12] <gemma> lol  
[16:12] <gemma> RJ will kick me on that one  
[16:12] <Doos> did that make it more clear and easier to remember?  
[16:12] <gemma> yes.  
[16:13] <Doos> holdon, finding the page  
[16:13] <gemma> no matter what is learned and all the new technologies, i think we forget to read the masters and get lost  
[16:13] <gemma> only kidding doos.  
[16:13] <gemma> on the page i mean  
[16:14] <Frank> Your just saying that  
[16:14] <Doos> page 615  
[16:14] <Frank> cos your feeling guilty  
[16:14] <gemma> i want my cat woman suit back, frank  
[16:14] <Frank> No chance....I've glued it on  
[16:14] <gemma> thank you doos  
[16:14] <gemma> but frank, i bribed doos with it  
[16:14] <gemma> ok. serious again.  
[16:14] <Frank> tough.....(smug smile)  
[16:15] <Doos> so that will be in addition to "totally enclosing space" in your answer  
[16:15] <Frank> Have you been to the dutch philosophy / crystallography site anyone?

[16:16] <gemma> we will need to remember that doos, as i am sure another newbie will come up with that confusion soon  
[16:16] <Doos> which one Frank?  
[16:16] <gemma> is that doos' site?  
[16:16] <Frank> No this guy is great...wait till I find his site  
[16:16] <TNPearl\_> LOL  
[16:17] <gemma> doos, the chat originally started with twinning  
[16:17] <Doos> yes  
[16:17] <Frank> He's got oodles of info on crystallography mixed up with philosophy  
[16:17] <gemma> how much about corundum and twinning do we have to understand.  
[16:17] <gemma> i guess i'm confused as to how diagnostic it is  
[16:17] <Doos> you didn't bookmark it Frank?  
[16:17] <gemma> for corundum  
[16:17] <Frank> [http://metafysica.nl/index\\_a.html](http://metafysica.nl/index_a.html)  
[16:17] <gemma> (frank's scots, give 'im a break)  
[16:18] <Frank> I had it bookmarked but had to switch firefox on to get it  
[16:18] <gemma> god. how do you like the java popup?  
[16:18] <africanuck> hilarious  
[16:18] <Frank> bookmark it for later...it's immense  
[16:19] <Frank> He's even madder than doos  
[16:19] <Frank> sorry doos  
[16:19] <Doos> the opeing warning alone was funny  
[16:19] <africanuck> probably a relative  
[16:19] <gemma> just our style. isn't it amazing how whacked out most of us are? it's great.  
[16:19] <Frank> yes....it's almost impossible to understand at places..  
[16:19] <Doos> from his name he is a southerner aswell  
[16:20] <TNPearl\_> uh  
[16:20] <africanuck> must be something they feed you guys when you are little...or those candy sprinkly sandwiches that you have for breakfast  
[16:20] <Frank> Try this page  
[16:20] <Frank> <http://metafysica.nl/crystal.html>