

[00:18] <dav> what r we going 2 discuss 2night?
[00:18] <Doos> so shall we start talking about critical angles and TIR?
[00:18] <dav> ok
[00:18] <Doos> need to be fit tomorrow, so I can't make it late today
[00:19] <Annutara> Okay.
[00:19] <dav> good. we will sleep earlier then
[00:19] <Doos> everybody ready, or has questions before we start
[00:19] <dav> one pls
[00:19] <Doos> go ahead dav
[00:19] <dav> how to separate
[00:20] <dav> aventur feldspar from
[00:20] <dav> aventur quartz?
[00:20] <Doos> feldspar is biaxial and quartz is uniaxial
[00:20] <Annutara> what is aventur feldspar?
[00:20] <dav> if cabochon?
[00:21] <dav> and almost opaque?
[00:21] <Doos> I would say specific gravity and surface structure
[00:21] <Doos> Annie?
[00:21] <dav> Sg both approx 2.61!!!
[00:22] <Annie> yes
[00:22] <Annutara> inclusion study
[00:23] <Annie> Doos, did you wana say something
[00:23] <Doos> distinction between aventurine quarrtz and aventurine
feldspar
[00:23] <dav> what will u see?
[00:23] <Doos> do you have a simple answer to that Annie
[00:23] <Annie> oh yes, i been answering questions to Annuatra,
[00:24] <Annutara> some tiny green specks in aventurine quartz
[00:24] <dav> due to mica ok?
[00:24] <Annie> hand on let me read this
[00:24] <Annutara> aventurine feldspar is sunstone right?
[00:25] <Annutara> gold specks?
[00:25] <Annie> the sheen
[00:25] <Annie> you mean sunstone versus aventurine quartz
[00:25] <dav> no sunstone is avent glass.
[00:25] <Annutara> ??
[00:26] <dav> feldspar vs quartz both AVENTURINE
[00:26] <Annie> sunstone has copper platelets
[00:26] <Annie> aventuring quartz is coloured by fuchsite mica
[00:26] <dav> but sunstone is avent glass, right?
[00:26] <Doos> no
[00:26] <Annie> can be green or orange
[00:26] <Annie> but it does not have the sheen of a sunstone
[00:26] <Annie> both have aventurence
[00:27] <Annutara> so differentiation is green specks vs gold specks
[00:27] <Annie> yes
[00:27] <Annutara> That's what I feel
[00:27] <Doos> or black spots
[00:27] <Annutara> of aventurine quartz?
[00:27] <Doos> yes
[00:27] <Annie> well if you magnify the green variety you will see
patchiness and the mica in black
[00:28] <dav> yes but all these observations are for Avent Glass vs Avent
Quartz.
[00:28] <Annie> polariscope too
[00:28] <Doos> no dav, for the feldspar sunstone
[00:28] <Annie> no not glass
[00:28] <Annie> crptocrystalline materials

[00:29] <Annie> the diaphaneity should help
[00:29] <dav> sorry Avent glass is goldstone, my fault.
[00:29] <Annie> one is purely opaque
[00:29] <Annie> and quartz is translucent on the edges
[00:29] <Annie> the centre will be blocking slightly as the light is not truly transmitted
[00:30] <Annie> and the little crystals are dispersed in small variation of misorientation
[00:30] <Annie> do you understand that
[00:30] <Annie> in other words the crystals or inclusions that make up the overall appearance in quartz are randomly oriented
[00:31] <Annie> clear or not, dave
[00:31] <dav> yes, I mixed the words, 10x 4 ur observ.
[00:31] <Annie> goldstone is not a true feldspar
[00:31] <dav> 10x Annie
[00:31] <Annie> yes
[00:32] <Annie> it is only a glass
[00:32] <Annutara> How do you differentiate goldstone from sunstone?
[00:32] <Annutara> RI SG etc?
[00:32] <dav> yes I mixed goldstone 4 feldspar: that was my fault.
[00:33] <Annie> no no... nobody's fault, we are learning and just making sure you understand,
[00:33] <Annie> it helps you, i hope
[00:33] <dav> very kind...10x
[00:33] <Annie> yes you can use 10x handlens
[00:33] <Annutara> The effect of sunstone is aventurescence right?
[00:34] <Annie> yes
[00:34] <Annie> true
[00:34] <Annutara> Gem-A lists 'spangled effect'
[00:34] <Doos> so, critical angles?
[00:34] <dav> ok
[00:34] <Annie> does that help you, Dave
[00:35] <dav> yes Annie: full answer!
[00:35] <Annie> great
[00:35] <Annie> please continue, Doos with CA
[00:35] <Doos> ok
[00:36] <Doos> when light coming from air enters a gem it gets refracted inside the stone due to differences in velocity of light
[00:36] <Doos> basic refraction
[00:36] <Doos> the reverse is also true
[00:37] <Doos> when light is in the gem, it may want to leave the stone and return to air
[00:37] <Doos> but sometimes it gets trapped inside the stone due to something called a critical angle
[00:37] <Doos> that is what causes TIR (total internal reflection)
[00:38] <Doos> the critical angle of a gem (or any optically dense material) is different from one and the other and is related to the RI of that material
[00:39] <Doos> for instance diamond has a critical angle of about 24°
[00:40] <Doos> all light that hits the innersurface of the diamond at an angle larger than ±24° gets reflected back in the stone
[00:40] <Doos> every ray within the 24° will refract out of the stone
[00:40] <Doos> any questions sodar?
[00:40] <Doos> sofar
[00:40] <Annie> can i go to the loo
[00:40] <Doos> sure lol
[00:41] <Annutara> haha
[00:41] <Doos> she has been raised well our Annie

[00:41] <Doos> does everyone understand the velocity of light thingy?
[00:42] <dav> y
[00:42] <Annie> ok
[00:43] <Annie> Sara, are you clear with that
[00:43] <Doos> if I would give the velocity of light in a particular material .. would you be able to calculate the critical angle?
[00:43] <dav> $n = 1/\sin c$ ok?
[00:44] <Doos> c is?
[00:44] <dav> Critical angle.
[00:44] <Doos> almost
[00:44] <dav> why?
[00:45] <Doos> well first you need to calculate the n
[00:45] <dav> wait
[00:45] <dav> $n = v_{\text{in air}}/v_{\text{in material}}$ ok?
[00:45] <Doos> yes, go on
[00:46] <dav> $v_{\text{in air}} = 3 * 10^8$ m/s. end.
[00:46] <dav> ok?
[00:46] <Doos> what is the n if the velocity of a gem is 124000 km/sec
[00:47] <dav> 1st u need to convert km/sec to m/sec.
[00:47] <Annutara> Diamond
[00:47] <Annutara> 24 degrees
[00:47] <Doos> we want to see calculations Annutara
[00:47] <Annutara> $124000 \text{ km/s} = 1.24 \times 10^8 \text{ m/s}$
[00:48] <Annutara> $n = 3/1.24 = 2.41$
[00:48] <Doos> very good
[00:48] <Annutara> $c = \sin^{-1}(1/2.41)$
[00:48] <dav> $n = 3 \times 10^8 / 124000000 =$ use calcu
[00:49] <Doos> that is indeed the correct calculation and answer
[00:49] <Doos> glad you both picked that up
[00:49] <dav> perfect annu!!
[00:49] <Annutara> Your's perfect too!
[00:49] <dav> I mean ur working.
[00:49] <Annutara> Nice revision for dips
[00:49] <Annutara> :)
[00:50] <Annutara> Annie back?
[00:50] <Doos> do you know why it is important to know the critical angle of a gem?
[00:50] <dav> for the cutting/fashioning.
[00:50] <Doos> indeed
[00:51] <Annutara> is it useful for cabs?
[00:51] <Doos> not very lol
[00:51] <Annutara> :)
[00:51] <Annutara> sometime stupid questions brightens up the day
[00:51] <Doos> that is really all there is to say about critical angles and TIR
[00:52] <dav> so?
[00:52] <Annutara> You are really trying to keep things short!
[00:52] <Annutara> haha
[00:52] <Doos> maybe Annie has more to add
[00:52] <Annutara> In the meantime, can I clarify something?
[00:52] <Annie> if the critical angle is large, the R_i is small
[00:52] <Annutara> oops
[00:52] <Doos> I was kinda suspecting I need to explain the calculations, but seems not
[00:53] <dav> ur quest annu?
[00:53] <dav> question...
[00:53] <Annutara> Not related to critical angles and TIR
[00:53] <Doos> go ahead

[00:53] <Annutara> Let's carry on first
[00:53] <dav> doos? permission?
[00:53] <Annutara> I'll ask later
[00:53] <Doos> sure go ahead
[00:54] <Annutara> It's about adulescence, labradorescence, sheen etc
[00:54] <Annutara> We'll clarify those later
[00:54] <Doos> we can do a whole session about them
[00:54] <Annie> Dave, please ask your question
[00:55] <Doos> next week orso
[00:55] <dav> annu before me had one....
[00:55] <Annie> he wants it claritied later
[00:55] <Annutara> dav your turn
[00:55] <dav> ok
[00:56] <dav> when we say Fe spect it means
[00:56] <dav> due to
[00:56] <dav> Fe 2 OR Fe 3 OR
[00:57] <Annie> iron
[00:57] <dav> Fe₂/Fe₃ OR Fe₂/Ti₄ IVCT?
[00:57] <Annie> you mean
[00:57] <Annutara> I think in any form
[00:57] <dav> YES
[00:57] <Annie> in the blue - any form there is no differentiation
[00:57] <Doos> just iron in general dav, but charge transfer is specifically mentioned
[00:58] <dav> so can we quote them all when we say iron spect?
[00:58] <Doos> I would not mention the latest one
[00:58] <Doos> last
[00:59] <dav> but in heliodor and sapphire?
[00:59] <Annutara> Heliodor is O₂- Fe³⁺ charge transfer I think
[00:59] <Doos> you could mention the charge transfer where applicable
[01:00] <dav> that is?
[01:00] <dav> only sapphire?
[01:00] <dav> blu
[01:01] <Doos> basically yes
[01:01] <Annie> the sapphire also is attracted to Ti, therefore giving itself to form the colour, in other words
[01:01] <Annie> colour of blue, yes
[01:01] <dav> ok ivct = blu sapphire otherwise Fe₂/3. correct?
[01:02] <Doos> no, others may play a role aswell
[01:02] <dav> which?
[01:02] <Doos> almost any transition metal and some more
[01:02] <Doos> they can all play a role in sapphire
[01:03] <dav> but spect dut to Fe ok?
[01:03] <Doos> I would not go that deep on your answers in the foundation examination or when answering your assignments
[01:03] <Annie> other transition metals can form other colours
[01:03] <dav> diploma....
[01:04] <dav> in sapphire annie?
[01:04] <Annie> but not for the blue sapphire
[01:04] <Doos> stick to what is said in the syllabus and some things that you have read up on .. like the G&G article I mentioned last week
[01:04] <Annutara> I think Fe spectra is the 3 stripes in greenish blue sapphires
[01:04] <dav> or that wvw ok doos?
[01:04] <dav> y annu
[01:05] <Annutara> and not the 450nm line
[01:05] <Annutara> that's my gut feeling
[01:05] <dav> Gem-A says Fe+Ti 4 blu sapphire

[01:05] <dav> ie 450nm
[01:05] <Annutara> 450 is due to Ti-Fe charge transfer, totally different from ionic electron colouring
[01:06] <dav> blu sapphire has 1 line at 450nm due 2 Fe+Ti.
[01:06] <Annutara> 3 stripes in greenish blue or yellowish blue sapphires is due to Fe²⁺
[01:06] <Annutara> and Fe³⁺
[01:07] <dav> and/or I think
[01:07] <Annutara> Let me check my notes
[01:07] <dav> doos? annie?
[01:07] <Annutara> Might be "and/or"
[01:07] <Doos> and/or is correct .. most of the time and
[01:07] <Annutara> I personally feel that IVCT is another mechanism of colour production altogether
[01:07] <Doos> yes it is Annutara
[01:08] <Doos> hey guys I need to get some sleep .. I'll stay in here for logging purposes
[01:08] <Annutara> Then technically speaking I cannot call Fe-Ti IVCT Fe spectrum
[01:08] <Doos> night all
[01:08] <Annutara> See you doos
[01:08] <Doos> hugs Annie
[01:08] <Annie> night
[01:08] <dav> 10x doos see u.
[01:09] Nick change: Doos -> Doos_away
[01:09] <Doos_away> bye bye .. next week on sheen etc?
[01:09] <dav> annu ur foundation or diploma?
[01:09] <dav> or treat doos pls?
[01:09] <Annutara> Dip
[01:10] <dav> so ur 4 d June exams
[01:10] <Annutara> Yeah
[01:10] <dav> and from where r u?
[01:10] <Annutara> Singapore
[01:10] <dav> That's far!!
[01:10] <Annutara> Dips list dispersed metal ions and charge transfer as different modes of colour production
[01:11] <Annutara> Fe spectra I believe refers to dispersed metallic ions
[01:11] <dav> yes. it is. but when to know u have ivct or dispersed metals?
[01:11] <Annie> whats happend to Sara
[01:11] <Annutara> Just that the Fe in Fe-Ti can produce Fe spectra on its own too
[01:11] <dav> i dunno annie.
[01:12] <Annie> Dave, I do not think that you need to write into much detail
[01:12] <dav> so why blu sapphire there is written Fe+Ti spect?
[01:12] <Annutara> Let me check
[01:13] <dav> I like to have a full (or almost) picture annie.
[01:13] <Annie> because it is somewhat associated with the two speaking
[01:13] <dav> annu what chapter r u studying right now?
[01:13] <dav> btw, r u distant learner?
[01:14] <dav> annie: 2 speaking??
[01:14] <Annie> i meant the iron and titanium
[01:14] <Annutara> I am doing causes of colour and mugging gemstones now
[01:14] <dav> ok
[01:14] <Annie> ok,
[01:14] <Annutara> FGA dips didn't call the spectra as iron
[01:14] <dav> mugging?

[01:14] <Annutara> They just gave a description
[01:14] <Annutara> Yeah you need to memorise the whole stack of gemstones
[01:15] <Annutara> Dips has plenty more.
[01:15] <dav> r u doing correspondance course?
[01:15] <Annutara> ATC
[01:15] <dav> ok
[01:15] <Annutara> But my instructor ain't teaching
[01:15] <Annutara> :)
[01:15] <dav> why?
[01:15] <Annutara> Not cost effective.
[01:15] <Annutara> I'm the only student.
[01:16] <Annutara> This is what FGA says of blue sapph spectra
[01:16] <dav> so how r u studying?
[01:16] <Annutara> "The absorption spectrum of blue sapphire usually consists of a group of three close bands in the blue;
[01:16] <dav> y
[01:16] <Annutara> if these bands are strong they may appear to merge into one broad band
[01:16] <dav> y
[01:17] <Annutara> A similar spectrum is seen in many green and golden stones."
[01:17] <dav> which pg?
[01:17] <dav> page
[01:17] <Annutara> They didn't make a reference to the spectrum as characteristic iron spectra
[01:17] <Annutara> 31-29
[01:17] <Annutara> Chapter 31 page 29
[01:17] <Annie> in actual fact they are the 450 and 465 merge as one full region
[01:17] <dav> yes but see in the pages related to the spectroscope.
[01:17] <Annutara> Yeah, the Gem Reference Guide gave that detail
[01:18] <Annutara> Give me the page
[01:18] <dav> yes or that.
[01:18] <dav> sorry I do not have my notes here....all from memory.
[01:18] <dav> but u can see the practical book: the same.
[01:18] <Annutara> Let me cf Gem Reference Guide
[01:19] <dav> y
[01:19] <dav> how r u preparing 4 june?
[01:19] <dav> btw, I m a distant learning.
[01:19] <Annutara> GIA lists cause of colour as Fe and Ti
[01:20] <Annutara> Dips or foundation?
[01:20] <dav> diploma like u
[01:20] <Annutara> That's good
[01:20] <dav> we r in the same sea my friend.
[01:20] <Annutara> I'm just doing the tutorials
[01:20] <Annie> Dave, Gem Reference guide page 67
[01:21] <Annutara> That's fancy sapphire
[01:21] <dav> maybe: I ve nothing w me here Annie.
[01:21] <Annutara> Blue sapphire is on page 72
[01:21] <Annutara> I'll check with my instructor :)
[01:21] <dav> but annie maybe u have an old version.
[01:21] <Annie> to page 80
[01:21] <Annutara> He will still answer my emails.
[01:21] <Annie> its from 72 to 80
[01:22] <dav> at least he answer them because mine does not!!
[01:22] <Annutara>

http://www.geohavens.com/index.php?option=com_content&task=view&id=109&Itemid=30

[01:22] <Annutara> I haven't put in spectra information...
[01:22] <Annutara> Now that we are on it, perhaps I'll ask Gemca for some spectra
[01:23] <dav> Gemca?
[01:23] <Annutara> On the forums
[01:23] <Annutara> Gemca
[01:23] <Annutara> Nice fella
[01:23] <Annutara> What chapter are you at now?
[01:23] <Annie> Dave, its a full chaper starts at 65 to pge 80
[01:23] <dav> I m preparing Hw Part3 of the inorganic gems
[01:24] <Annutara> You are very far ahead of me
[01:24] <dav> what annie?
[01:24] <dav> u are where annu?
[01:24] <Annutara> Oh
[01:24] <Annutara> I thought you said Organic
[01:24] <Annutara> I hate organic
[01:24] <Annie> well, i better go and let you guys speak on your own
[01:25] <dav> no Inorganic = till zircon....
[01:25] <Annutara> humm
[01:25] <Annie> but if you want to look up gem reference guide, - its starts from 65 to page 80
[01:25] <dav> annie before u go
[01:25] <dav> what did u tell me last thing?
[01:25] <Annie> yeah
[01:25] <Annie> i was looking up the book you wanted to know what page it was
[01:26] <dav> <Annie> Dave, its a full chaper starts at 65 to pge 80
[01:26] <Annie> i meant its very large (like a full chapter) in gem reference guide
[01:26] <dav> yes indeed.
[01:27] <Annutara> !
[01:27] <Annutara> Let's check Ruby and Sapphire!
[01:27] <Annie> ok, Dave
[01:27] <dav> what section r u at annu?
[01:27] <Annie> I am going to go now
[01:27] <dav> 10x annie
[01:27] <dav> g'night c u next sat.
[01:27] <Annie> have a nice day you both of you.
[01:27] <Annutara> See you next week annie
[01:28] <Annie> dunno what happened to Sar
[01:28] <Annie> see you next week
[01:28] <dav> maybe she slept...
[01:28] <dav> bye annie
[01:28] <Annie> tell her we said .. bye
[01:28] <dav> ok
[01:28] <Annie> take care
[01:28] <dav> annu?
[01:29] Annie (~Annie@210.84.5.4) left #go.