About Signia
Signia is one of the leading hearing aid brands in the world. Our goal is to enhance human performance through iconic innovations that shape prescription audio solutions. We refuse to accept hearing loss as a limitation. It’s not about correcting a loss, it’s about gaining an edge. Not just performing, performing brilliantly. Not hearing again, but hearing better than ever. Hearing every word, beat, and breath. With Signia, you can Be Brilliant.

1 Red Dot Design Award 2019 for Styletto Connect, IF Design Award 2019 for Styletto
2 Based on 19 hours wearing per day, or 17 hours wearing incl. 5 hours streaming per day
3 All ASHA-compatible Android phones
5 Hakvoort, Burton: Increasing Style, Reducing Stigma: The Styletto Solution (Signia Backgrounder, 2018)
6 Jensen, Postel, Taylor, Schulte: Performance of Signia A10 in At-Home Listening Situations (Signia White Paper, 2021)
7 Higher than 8 (on a 0-10 scale)
9 Based on 17 hours wearing per day including 5 hours of streaming

Find out more on signia-pro.com
Or ask your hearing care professional for more information on Signia hearing aids, useful accessories and the Signia app.

Compatible with Android and iOS. The app is free of charge.

The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases and are subject to change without prior notice.

The Bluetooth® word mark and logos are owned by the Bluetooth SIG, Inc. and any use of such marks by WSAUD A/S is under license. Other trademarks and trade names are those of their respective owners.

Find us on:

signia-pro.com
facebook.com/signiahearing
youtube.com/signiahearing
instagram.com/signiahearing

Order No. 04727-99C1-7600
©9 2021 WSAUD A/S
At Signia, we aspire to empower people to perform at their best and gain an advantage. To Be Brilliant. Our mission is to enhance human performance through iconic innovations that shape prescription audio solutions.

Signia offers a complete set of advantages to help you and your clients Be Brilliant: We consistently innovate superior audiology to lift your clients’ hearing experience to new heights and thereby ensure greater patient satisfaction. Our new Styletto AX rechargeable hearing aid is a game-changer both in terms of sound and looks. Its award-winning SLIM-RIC hearwear design has been optimized to be even smaller than its predecessors for an even more discreet fit.

Styletto AX features our leading-edge Augmented Xperience platform. It is the first to offer outstanding speech clarity in an immersive environment thanks to our revolutionary Augmented Focus™ technology. For instance, 100% of participants in a recent study reported excellent speech understanding in their home environment using this technology.6

And as your dedicated business partner, we support both you and your patients with leading fitting software and the state-of-the-art Signia app, which acts as an extension of yourself to best assist your clients out in the real world and strengthen your relationship with them.
Designed for brilliant hearing and looks

Our new Styletto AX rechargeable hearing aid looks as amazing as its sounds. Its award-winning SLIM-RIC design is the smallest ever for an even more discreet fit. Built on our leading-edge Augmented Xperience platform, Styletto AX uses our proprietary Augmented Focus™ technology to split speech from surrounding sounds, process them separately, and recombine them to deliver outstanding speech clarity in an immersive environment.

Styletto AX gives its wearers the speech clarity they need with the hearing aid features they want:

- **Wireless charging with Qi technology**
  Wearers can recharge their Styletto AX hearing aids at home or on-the-go for up to 17 hours of use per charge. The pocket-sized charging case’s Qi wireless technology enables them to simply place the charger on a charging pad instead of having to plug it into the mains. Wherever they’re going, Styletto AX goes with them. And goes and goes – the charging case delivers an astounding 4 days of user autonomy without the need to charge the case.

- **Android & iOS connectivity**
  Styletto AX offers state-of-the-art Bluetooth connectivity so wearers can connect to their Android® or iOS device to stream phone calls, music, TV and more in high-quality digital sound. They can also connect their hearing aids to the Signia app, which features groundbreaking artificial intelligence (AI) via the Signia Assistant.

- **Signia Assistant**
  Inspired by the way the human brain’s neural network solves challenges, the Signia Assistant offers immediate support whenever wearers need to adjust their settings. When a change is made, the Assistant collects information regarding the wearer and the acoustic situation. You can see all these interactions between the wearer and the Assistant in the Connexx fitting software.

  The live deep neural network AI that drives the Signia Assistant marks a revolution in hearing care. It is a living system that continuously learns about individual needs in specific situations, moving from a one-size-fits-all approach to data-driven knowledge for precisely tuned hearing for every individual.

As a result, 93% of users regard the Signia Assistant as a meaningful innovation that raises their satisfaction with their hearing aids in difficult listening situations. It can also drive sales because an overwhelming 87% of consumers would choose hearing aids with such an AI assistant when buying new devices.

8 out of 10 people prefer the SLIM-RIC design

Styletto AX is a game-changer for your practice. Its refined slim-line hearwear styling is preferred by 8 out of 10 people compared to conventional hearing aids. This eye-catching quality enables you to attract new and existing hearing aid wearers.
Hearing isn’t always easy. A big group of people talking at the same time, softly spoken talkers, too much background noise… Sometimes sounds blend together making it impossible to focus on what you want to hear.

Styletto AX is built on our leading-edge Augmented Xperience platform to solve this problem.

Augmented Xperience changes the way your clients hear the world. Instead of them having to strain to discern speech from background noise, our proven platform uses proprietary Augmented Focus™ technology to process the two separately and create a clear contrast. It then recombines them to deliver outstanding speech clarity in a fully immersive environment.

Hearing aid wearers who have already experienced this revolutionary technology confirm its benefits: a full 100% of participants in a recent study reported excellent speech understanding in their home environment. An overwhelming 95% of participants in the same study said they were satisfied with Augmented Xperience. They also enjoyed more than 25% better speech understanding in noise than with their previous hearing aids.

So what makes Augmented Xperience so successful?

Traditionally, hearing aids have processed all sounds under one set of rules. The problem with only having one processor is that all signals are competing against each other. If you prioritize one part, another is neglected. With Augmented Xperience, two dedicated processors can fully optimize different parts without compromising one or the other. It shapes the sound of speech and surroundings in a way that delivers outstanding speech clarity while making surroundings sound enjoyable.

Our new Augmented Xperience platform is even proven to perform better than normal hearing in a tested party scenario.

Augmented Focus™ consists of two independent processors working in parallel with dedicated tasks.

**Focus sounds**

Focus sounds carry relevant information where every small detail is important, for example the speech of a conversation partner. These sounds are processed in a highly linear, uncompressed way with emphasis on clarity and details. This pulls speech closer to the listener, so it sounds as clear as possible.

**Surroundings**

Surroundings contain all sounds outside the main focus placing the wearer in the correct acoustic atmosphere. This is important to create both awareness and excitement, for example enjoying piano music and laughter in a café. These sounds are processed with high spatial resolution, applying more compression and attenuation to keep them at a distance from the focus sounds. Sudden loud sounds can be addressed more quickly than ever before to prevent them from masking focus sounds.

Augmenting reality in the wearer’s favor

Two separate processors allow us to fully capture focus and surroundings independently. As a result, we can control how we recombine them. To create a greater contrast, Augmented Focus pulls focus sounds closer and places surroundings a bit further away. This augments reality in the wearer’s favor.

In a recent study, 85% of participants performed better in a speech test with Signia AX than with their previous hearing aids. 84% reported excellent speech loudness.

**Conventional processing**

**Augmented Focus™**
Signia AX

Experience a range of audiological innovations

A range of innovative technologies combine to deliver this unprecedented augmented hearing experience:

- **e2e wireless 4.0 – A great leap for true binaural hearing**
  Our new ear-to-ear (e2e) system e2e 4.0 syncs more binaural audio data than ever, ensuring clearer speech processing and high-precision directional awareness. It also significantly boosts the speed of data transmission, delivering a much smoother sound experience and inaudible shifts between different settings. Latency is reduced by 60% so that transitions between different modes are no longer audible.

- **Increased input dynamic range**
  The microphones and the state-of-the-art analogue input stage can handle signals up to 117dB with great sound quality. That’s very close to the full capacity of human ears and ensures a clean crisp signal, for example at music concerts.

- **TruEar 360**
  The powerful processing engine allows for an exceptional TruEar 360 mic mode that better reproduces and emphasizes the capabilities of the natural pinna-effect better than ever. TruEar 360 highlights the difference between front and back sources of sound to make localization of sound sources easier.

- **Own Voice Processing (OVP)**
  OVP processes the wearer’s own voice completely independently from all other sounds, including all other voices. This allows you to fine-tune the hearing aids for optimal audibility of the entire acoustic environment without having to compromise this audibility to improve the sound quality of the wearer’s own voice.

- **Enhanced feedback cancellation**
  e2e 4.0 also synchronizes feedback cancellation between the ears in the same phase, removing more artifacts for a smoother overall sound experience.

- **Direct streaming for iOS and Android**
  Augmented Xperience offers direct streaming for both iOS and ASHA-compatible Android smartphones. It handles the signal of a streaming input independently from other signals, ensuring that the sound is even cleaner and easier to optimize.

---

**Signia Augmented Xperience chip at a glance**

- 2x Audiological core processors
- 110% Increased binaural audio transfer rate
- 60% Reduced binaural latency
- 27% More electric circuits
- 22% Longer battery runtime
The full range of form factors your customers need to

Be Brilliant™

- **Styletto AX**
  A game-changer in sound and looks. Its award-winning SLIM-RIC hearwear design is smaller than its predecessor for an even more discreet fit, while its Augmented Focus technology delivers outstanding speech clarity in an immersive environment. Styletto AX offers recharging on-the-go and Android and iPhone connectivity, including the Signia Assistant.

- **Insio C&G AX**
  Insio C&G AX redefines custom hearing aids with a smaller design for a higher fitting rate and all-day comfort, our leading-edge Augmented Xperience platform for outstanding speech clarity, and the first Li-ion contactless charging for custom hearing aids. It also boasts Android and iPhone connectivity, including the Signia Assistant.

- **Pure 312 AX**
  Pure 312 AX
  Equipped with all the benefits of our Augmented Xperience platform for outstanding speech clarity, these tiny and attractive hearing aids provide fully-featured Bluetooth connectivity for Android and iPhone, including the Signia Assistant.

- **Pure C&G AX**
  Pure C&G AX
  Now available in all performance levels, Pure C&G AX and T AX combine an attractive design with proven rechargability, state-of-the-art Bluetooth connectivity for Android and iPhone, and the landmark AI of the Signia Assistant. Pure C&G T AX features a T-coil for those who want the support of an induction loop system.
The first custom hearing aids with contactless charging and Bluetooth

Our new rechargeable Insio Charge&Go AX hearing aids are built on our leading-edge Augmented Xperience platform to deliver outstanding speech clarity in an immersive environment. They even include a motion sensor to adapt their sound optimally to the wearer's situation by detecting if they are moving or stationary.

And Insio Charge&Go AX boast a wealth of additional innovative high-tech features that allow your custom hearing aid wearers to shine and be Brilliant in their daily life.

Insio Charge&Go AX

Contactless charging for effortless energy

These are the first custom hearing aids with Li-ion contactless charging. Wearers simply place Insio Charge&Go AX in the Insio Charger without having to worry about any exact charging contact, charge them while resting or sleeping, and then go—true to their name. And keep going throughout the day with up to 20 hours of use on a single charge.

Android & iOS connectivity

Insio Charge&Go AX also offer state-of-the-art Bluetooth connectivity for Android® and iOS devices. So wearers can easily stream their phone calls, music and TV audio via their custom hearing aids. They can also connect to the Signia app and its star attraction: the Signia Assistant with its live deep neural network AI for the most personalized augmented hearing experience.

Insio Charge&Go AX ITCs and ITEs are the ideal solution for experienced wearers who are looking for a personally tailored high-tech hearing solution to excel in their private and professional life.

Key features

- Smaller, discreet design for a higher fitting rate and all-day comfort
- Outstanding speech clarity
- Contactless charging
- Android® & iOS connectivity
- Signia Assistant

Signia AX

Insio Charge&Go AX

Performance levels

7 – 5 – 3

Insio Charge&Go AX
Pure 312 AX and CROS Pure 312 AX

The small RIC for outstanding speech clarity

Equipped with all the benefits of our Augmented Xperience platform for outstanding speech clarity, Pure 312 AX and CROS Pure 312 AX attract wearers with their fresh, elegantly slim design. Despite their discreet form, these tiny hearing aids provide fully-featured Bluetooth connectivity for maximum enjoyment of music, calls and TV from Android® and iOS devices, plus all the benefits of our Signia Assistant. Pure 312 AX’s Zn-Air battery delivers a runtime of around 4 days.³

Key features

- Outstanding speech clarity
- Android® & iOS connectivity
- Signia Assistant
- Available in all performance levels

Pure 312 AX is available in all performance levels so you can meet the needs of as many existing and potential customers as possible.
Signia AX

Pure Charge&Go AX, CROS AX and T AX

Immersive sound in a small rechargeable RIC

Now available in all performance levels, Pure Charge&Go AX is ideal for experienced and first-time hearing aid wearers who are looking for a sleek aesthetic device that is fully featured. It combines an attractive design with proven rechargeability, state-of-the-art Bluetooth connectivity for Android3 and iOS, and the landmark AI of the Signia Assistant.

Pure Charge&Go AX is also available as a CROS device. And Pure Charge&Go T AX, also available in all performance levels, features a T-coil for those who want the support of an induction loop system.

Both models come with a compact charger with the option to upgrade to a portable or a Dry&Clean charger. The Li-ion power cell of Pure Charge&Go AX delivers up to 24 hours of use on a single charge including 5 hours of streaming for complete flexibility on the move. The impressive Li-ion power cell of Pure Charge&Go T AX delivers up to 36 hours of use on a single charge including 5 hours of streaming.

Key features

- Outstanding speech clarity
- Recharging on-the-go (with portable charger)
- Android3 & iOS connectivity
- Signia Assistant
- Available in all performance levels

Performance levels

7 – 5 – 3 – 2 – 1

sDemo

Pure Charge&Go AX
CROS Pure Charge&Go AX

Pure Charge&Go T AX
Integrated T-coil

Performance

Black
Graphite
Dark champagne
Silver
Pearl white
Fine Gold
Deep brown
Sandy brown
Rose gold
Beige

Augmented Speech Understanding
Immersive Soundscapex
Android3 & iOS connectivity
Recharge on-the-go
Automatic Situation Detection
AI Assistant
Signia software makes your job easier

From our all-in-one Signia app to our Connexx fitting software, Signia supports you and your clients at every step

The Signia app for your clients’ iOS and Android smartphones only shows the user functions applicable to their devices. The app offers not just remote control but also two revolutionary solutions that make it easier for you to fit customers and for them to stay in touch with you when they are away from your premises.

Signia Assistant
With its live artificial intelligence deep neural network, the Signia Assistant ensures that the end-user always gets the best possible solution for any given situation, always tailored to their specific needs and preferences.

It provides your clients with easy answers to all questions on handling, including showing them helpful videos in the app that are relevant to their specific device. In this way, people get the support they need during the entire onboarding process and you can spend the time at follow-up appointments more effectively.

TeleCare
Signia TeleCare enables you to support your clients remotely, so they get your help in real-life situations when they need it. You can hold virtual appointments via phone or video call and adjust the hearing aid settings remotely in the Connexx fitting software.

Connexx with Augmented Xperience
Our Connexx fitting software puts you in the driver’s seat with real-world insights to optimally support each individual patient.

First Fit in Connexx configures Signia AX hearing aids to allow the wearer to hear what is important to him or her. The First Fit settings have been carefully optimized to provide a good starting position for each wearer.

The Dynamic Soundscape Processing (DSP) control in Connexx provides a slider to adjust to your clients’ individual preferences. This slider is now more powerful than ever thanks to our new Augmented Focus™ technology.

For your clients to fully optimize their personal sound in the situations important to them, they can use the Signia Assistant. The Assistant can fine-tune the DSP slider and show you if any changes were made from the initial settings. You can view details about each specific interaction: The situation your client was in at a particular date and time, the issue that required assistance, and the solution implemented by the Assistant.
**Better physical fit and on-ear attractiveness**

Our new EarWear 3.0 offers a higher physical fit rate, improved cosmetics and better retention.

EarWear 3.0 provides you with a comprehensive solution which is highly reliable in its acoustic performance and highly durable so it improves the cosmetic appeal as well as physical fit & retention in the ear. So your clients enjoy the most comfortable, cosmetically appealing solution with consistently great sound.

The new eartips come in different sizes and a closed and open build version suitable for the vast majority of ear anatomies and hearing needs. This means that you can now fit more people with state-of-the-art Signia hearing aids than ever before.

Your EarWear 3.0 advantages at a glance:

**Higher physical fit rate**
The combination of smaller receiver cross sections, softer eartips providing a smaller receiver front, and a new cable geometry results in major physical fit rate improvements for the miniReceiver 3.0 portfolio.

**Cosmetically appealing**
Improved cable/tube bending and in-ear position ensures a closer fit on the ear, making it less visible. Every variant is available in the lengths 0-4.

**Better retention**
A special bending of the cable/tube and its outlet locks the acoustic coupling reliably into the ear canal, with no lateral migration and no need for an anchor.

**New eartips**
Compatible with miniReceiver 3.0 and ThinTube 3.0 and easier for your clients to exchange (compared to click domes).

**Smaller hearing aids**
The introduction of a substantially smaller plug allows for smaller RIC designs overall.

**Improved usability**
The proven design makes click domes much easier for consumers to exchange.

To further strengthen durability and reduce damage to cables and tubes, the miniReceiver 3.0 features a reinforced cable outlet while the ThinTube 3.0 is made out of one piece. A Titanium Shield on all miniReceivers 3.0 provides optimal anti-allergic performance.

You can offer Signia AX hearing aid wearers a choice of different chargers to power their hearing aids, depending on their preferred hearing aid and lifestyle.

**Pure Chargers**

**A world of charging possibilities**

All Pure chargers use galvanic charging technology and are compatible with Pure Charge&Go AX, Pure Charge&Go T AX and CROSS Pure Charge&Go AX.

Each delivers a full charge in around 4 hours and offers 30 minutes quick charging so wearers can boost the runtime of their devices beyond a full day for maximum flexibility free from annoying battery changes, whether they are on a long journey or just want to stream audio for many hours.

**Styletto AX Charger**
This elegant portable charging case matches Styletto AX’s award-winning design. It features Qi Wireless charging technology for up to 4 full charges of Styletto AX on-the-go.

**Styletto AX Dry&Clean Charger**
The ultimate in state-of-the-art charging technology, the Styletto AX Dry&Clean Charger not only charges the hearing aids but also offers UVC cleaning and drying technology to keep the devices in peak condition. The UVC cleaning starts automatically when the hearing aids are placed inside and is completed in just 15 minutes.

**Insio Charger**
This revolutionary charger provides the first Liion contactless charging for custom hearing aids. No specific charging position is required - wearers intuitively place their Insio C&G AX hearing aids in the charger as if it were a jewel case.

**Pure Portable Charger**
This small and highly reliable desktop charger addresses basic needs when it comes to providing power to the hearing aids. 2 LEDs indicate the charging status (one per hearing aid).

**Pure Dry&Clean Charger**
Like its Styletto AX counterpart, the Pure Dry&Clean Charger offers UVC clearing and drying technology to keep the devices in peak condition. 3 LEDs per hearing aid indicate their charging status and an additional LED indicates the cleaning status.
<table>
<thead>
<tr>
<th>Features</th>
<th>Information</th>
<th>Performance levels</th>
<th>Features</th>
<th>Information</th>
<th>Performance levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic Soundcape Processing 2.0</td>
<td>Dynamic Soundcape Processing takes sound processing to a more precise level by including motion data for a more realistic sound adapted to everyday life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Augmented Focus**</td>
<td>Separates the focus sound (speech) from surroundings, creating a clear contrast between the two, which makes it easier to follow conversations.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acoustic Sensors</td>
<td>The redesigned acoustic sensors can detect more variables of sound than ever before, providing more accurate information about the environment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e2e wireless 4.0</td>
<td>Control coupling, synchronization, binaural directionality, Spatial Speech Focus, CROS/BICROS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motion Sensor</td>
<td>An integrated motion sensor detects whether the wearer is walking, running or sitting still. This motion data complements the acoustic data to optimize Dynamic Soundcape Processing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OVP** (Oven Voice-Processing)</td>
<td>Oven Voice-Processing OVP** utilizes real-time recognition of the wearer's voice to deliver a natural voice impression. Available for RIC/BTE devices with e2e wireless in binaural fittings.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sound Clarity</strong></td>
<td>SoundClarity provides full-scale sound coverage which covers the full spectrum of everyday sounds.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Signal processing / Gain &amp; IMPO</strong></td>
<td>Channels handle in Context. For Signia AX, channels are per processing chain (Focus/Surroundings).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hearing Programs</td>
<td>Number of programs configurable in Connex.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended dynamic range</td>
<td>117 dB 4-bit processing for enhanced digital encoding of soft and loud sounds.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech and noise management</td>
<td>Reduces listening effort using sophisticated sound processing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SoundSmoothing</strong></td>
<td>Reduces the annoyance of sudden loud impact sounds such as when handling glassware.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback cancellation</td>
<td>High-speed monitoring and control of feedback in individual processing channels.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HD-Music</td>
<td>Presents programs for enhanced enjoyment of non-streamed music.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eWindScreen</td>
<td>Reduces the annoyance of wind noise when outdoors.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended bandwidth</td>
<td>12 kHz bandwidth for enhanced processing of high-frequency speech and environmental sounds.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EchoShield</td>
<td>Dedicated program for reverberant environments.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Speech Quality</strong></td>
<td>Speech Quality delivers improved speech understanding and communication ease in noise.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Binaural Directivity</strong></td>
<td>Directly provides scientifically proven enhanced speech understanding in noise. Available for bilateral fittings with directional microphones and e2e wireless link.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wireless CROS/BICROS</td>
<td>Requires CROS transmitters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frequency compression</strong></td>
<td>Improves the detection of speech sounds for wearers with reduced high frequency hearing thresholds. Frequency compression is selectively activated based on audiological criteria.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spatial Speech Focus</strong></td>
<td>Depending on the direction of the dominant speech source, Spatial Speech Focus steers the directional beam to the left, right, or behind the wearer automatically in a car situation, or a dedicated “Strolling” program. Available for bilateral fittings with directional microphones and e2e wireless link.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) In Universal program: Automatic mic beam to the right / left / rear directions.
2) In Universal program: Automatic mic beam to the near, surround mode for side speech. In manual programs, microphone beam to the right/left/fear directions.